PLANT INDUSTRY DIVISION

Annual Report

June, 1986

Alberta
AGRICULTURE

INTRODUCTION

In 1985-86 the Plant Industry Division of Alberta Agriculture was comprised of five branches: Field Crops, Crop Protection, Soils, Tree Nursery and Horticulture Centre and Horticultural Research Center. The Crop Protection and Soils Branches were located in Edmonton while the Field Crops Branch was located at Lacombe, the Tree Nursery and Horticulture Centre at Oliver, and the Horticultural Research Center at Brooks.

The Division's main objective is to provide services in crop production and related sciences. The production, nutrition and protection of crop plants for food and aesthetic use is fundamental to agriculture. Practices recommended to farmers must also be concerned with long term conservation of the soil, sustainable productive capacity and the safety of all segments of the population. The activities of the five branches of the Division are geared to the attainment of these objectives.

This annual report provides some detailed information about the programs carried out by the branches of the Plant Industry Division and about their achievements during the year.

TABLE OF CONTENTS

page

INTRODUCTION i

TABLE OF CONTENTS ii

PROGRAM OBJECTIVES, SUMMARIES AND ACTIVITIES

A. Crop Protection Branch 1

Regional Laboratory, FAIRVIEW 24

B. Soils Branch 27

C. Field Crops Branch 48

D. Alberta Tree Nursery and Horticulture Centre 62

E. Alberta Horticultural Research Center 63

Regional Laboratory, OLDS 67

REGIONAL REPORTS 68

RESEARCH PROJECTS 91

PUBLICATIONS 108

PLANT INDUSTRY DIVISION STAFF LIST 121

CROP PROTECTION BRANCH

The Crop Protection Branch operated with a staff of twenty-nine permanent positions divided into three sections and an administrative group. In addition, two word processing operators assigned at Division level supported our work.

The Branch administered a budget of $2,071,000 plus special grant funds of $5.7 million in assistance programs for farmers stricken with grasshoppers and beekeepers suffering poor crops due to drought and insecticide spraying.

A very comprehensive program of publications and training projects was achieved. The publications produced can be found in the sections on publications.

In many cases authors outside the Branch or the Province contributed to or completed the manuscripts. The exceptional level of support received from the Alberta Environmental Center at Vegreville is recognized and appreciated in both publications and diagnostics. Several publications were prepared entirely by A.E.C. with this Branch coordinating the publishing.

Branch staff were also involved in producing displays, audio-visual material and survey work. A major educational project was the preparation and presentation of Crop Protection '86. This home study program, on integrated pest management, was prepared and presented to 3,000 students during the period of January - March.

Crop Protection staff were active in participation in departmental upgrading programs, particularly management training.

WEED CONTROL

Weed control remained a high priority in the minds of Alberta producers in 1985. In spite of tight economic conditions and limited rainfall during the growing season in most areas, an adequate level of weed control was experienced.

Some trends were observed in 1985.

1. Producer consciousness regarding soil conservation and farm economics encouraged continuous cropping. This reduced the frequency and timeliness of cultivations which appeared to stimulate the rise of such perennial weeds as Canada thistle, perennial sow thistle, toadflax and wild rose which in the past were controlled through the application of herbicides followed by cultivation.

2. Economic pressures affected all aspects of the agricultural chemical industry. An issue with producers was the perceived high cost of agriculture chemicals - the distributor was concerned with low margins and the manufacturer with the high cost of development. This created major shifts in the industry, one of which was the decision to cease the production of the wild oat herbicide Carbyne. This will have a negative impact on cereal grain producers in the tight economic times as it was the lowest cost wild oat treatment. Closer to home, some distributors are not likely to survive past 1986 due to the margin squeeze.

3. A noticeable rise in producers suing agricultural chemical companies for either herbicide non-performance or for crop injury was observed. The results of these actions are twofold. Firstly, it is likely to shift technology development. Weeds or crops will not be listed on labels unless there is almost a 100% probability of weed control or crop safety. This will mean some crops will not be registered, marginally suppressed weeds will not be identified on the label and any use on these crops or weeds will be illegal. There will be no registration for high risk area such as water canals or high value small acreage crops.

4. Due to high settlements in litigation cases, liability insurance has become a problem. Aerial applicators had some difficulty in obtaining drift insurance in 1985. It apparently will be more difficult or practically impossible to obtain it in 1986. This is likely to substantially increase the cost of custom spraying and stimulate those in the business to seek other insurance alternatives.

5. In the agricultural chemical industry the technologies of agricultural chemical development and crop variety development through advanced biotechnical methods are being combined to produce varieties that are tolerant to specific herbicides. The first of these was the triazine tolerant canola released several years ago. Indications are that others can be expected within the next 2-3 years.

6. A dilemma is present in the weed control area. Financial resources for publicly funded research are being reduced, resulting in limited work in crop rotation, cultural weed control and other projects which do not require a continued monetary input by producers (these are significant weed control techniques in times of low cash flow). Research in industry focuses on the development of new products, hybrid varieties and new pieces of equipment, all of which require continued purchases by the farmers. This trend is not likely to change without some basic re-evaluation of the agriculture industry.

Programs

- Training and extension activities continued to provide field staff, industry and producers with updated technical information to facilitate effective weed control. The major extension effort for the winter of 1985/86 was Crop Protection '86, a home study course which reached over 3,000 producers. In addition, weed control updates, sprayer calibration clinics, weed inspector schools and field sessions on the diagnosis of crop problems were offered to 700 participants. Active participation in regional

and district extension meetings, commodity group meetings and specialized training schools such as the pesticide applicators course, petroleum industry training sessions and courses directed at weed control in urban areas reached another 1,500 clients.

- The Weed Control Act continues to be actively used by most jurisdictions to persuade delinquent landowners to abide with their responsibility of adequate weed control. A ministerial stop order was used to prevent the spread of diffuse knapweed from a gravel pit in southern Alberta. In another instance the power of the Act convinced a jurisdiction to use leafy spurge infested gravel in hot asphalt mixes rather than spread it along municipal roads.

- No major weed fairs were held in 1985 but mini fairs were held in five of the six regions. Interest and attendance at these fairs was down and as a result this extension technique will not be used next year.

- The section continues to work closely with the Agricultural Service Boards throughout the province providing guidelines, technical assistance and consultation on weed programs. Guidelines have been provided for weed control on railway properties, roadside brush control and the handling of sprayer clinics. A cooperative project in conjunction with several Service Boards and the Department of Energy and Natural Resources is curbing the spread of leafy spurge in the St. Mary's River. Another program is directed at the upgrading of municipal roadside sprayers to increase the effectiveness of their roadside program.

- The computerized herbicide recommendation program is intended to aid in herbicide selection by matching weeds, crops, varieties, and their respective leaf stages to potential herbicide treatments. The program was designed for use at the district level and the first steps have been taken in that direction with access now

available in six regional offices, one district office and three research institutions. Expansion to four more district offices is anticipated this season. Producer requests to make programs more accessible to the farming public continue.

- The knapweed eradication program continued in Regions I and II. Infestation levels have decreased to isolated plants and some sites have recorded no knapweed for three consecutive years. All municipalities undertook eradication measures and are aggressively attacking the problem. British Columbia continued to cooperate by spraying the railway and highway west of the border in the Crowsnest Pass. Only a few plants were found in these corridors during 1985. An agreement in principal was made during 1985 with the State of Montana to establish a knapweed-free buffer zone at the Alberta/Montana border. This buffer zone should be in place during 1986. Knapweed awareness brochures were inserted in the tax notices of several municipalities in Region I. It is planned to increase this method of program promotion in 1986.

- The nodding thistle eradication program progressed well during 1985. The City of Calgary intensified their enforcement and eradication measures which have resulted in reducing the infestations to isolated plants.

- The urban vegetation management program continued to produce positive effects from the joint programming of target weeds with the local Agricultural Service Boards. Grants continue to assist towns and villages in the initial program establishment.

- Training courses and technical assistance were provided to Fish Creek and Kananaskis Country Park areas. Their weed management programs have progressed very well and are anticipated to improve even further during 1986. The success in these areas has created interest in another provincial park in the Lac La Biche area.

- Demonstration projects continued as in the past with emphasis on effective control of scentless chamomile, stork's bill and Canada thistle. The five sites were used at local Agricultural Service tours and other extension functions.

- Research projects were established in six municipal districts on local weed problems, such as toadflax, tall buttercup, and tansy. Information obtained on the biology and control of these weeds was transmitted to the producers experiencing the problem.

- Cooperative research projects continued to be a major priority.
  i) Investigation of methods of inactivation of residual herbicides as part of a well site reclamation program continued in conjunction with the Industrial Vegetation Management Association. Various soil amendments were tested including activated carbon and manure. The information from this project enhances the information contained in the procedure manual on reclamation.

  ii) Research on weed control in forages involved two projects. One addressed the tolerance of forage legumes and grasses to a variety of herbicides and the second project investigated how weed control in the establishment year affected stand longevity. This program was specifically designed to fill information gaps in this area and subsequently assist in improving the quantity and quality of forages in the province.

  iii) The "Evaluation of Herbicide Application Equipment" project done in conjunction with the Prairie Agricultural Machinery Institute was completed. This area of endeavor has stimulated interest in the chemical application community and Agriculture Canada, Regina has embarked on a long term project to evaluate application equipment.

- The Weed Alert program continued to provide information on the distribution and control status of key weeds. This program assists in offsetting the negative effects of staff turnover at the municipal level by providing continuity of information. The mapping capabilities of the program have been extensively used by other branches and divisions such as the Potato Program, SIDMAP and Field Services.

- "Crops of Alberta", a demonstration of the range of crops and varieties grown in the province, was initiated on a site in front of the J.G. O'Donoghue building. Response by visitors was very positive.

- A procedure was developed to assist the CNR and CPR in planning and budgeting for right-of-way weed maintenance. A very cooperative attitude was demonstrated by the railways in Alberta. With about 10% total Canadian trackage the railways in Alberta spend almost 30% of the total railway vegetation control dollars allocated in Canada. They are endeavouring, to the extent of their financial capabilities to accept their legal responsibilities to maintain their rights-of-way as weed-free as the adjacent land.

- Alberta Transportation, in the past, has depended upon the municipalities, in most cases, to handle any weed spraying required while they concentrated on mowing. Neither method was at all efficient. Mowing was done in many cases long after seed had been produced. The same objection applied to the spraying as done by the municipality. The spray rig is used to complete all requirements on the municipal roads before being diverted to do work for Alberta Transportation. In 1985 preliminary work was completed to have Alberta Transportation accept full responsibility for weed control on rights-of-way of all numbered highways. This will be done using owned equipment or by contracting depending upon the district involved.

- A plan of action to assist municipalities to properly plan and implement weed and brush control programs on roadsides was developed and is gradually being implemented. This planned approach will ensure better return for the expenditure involved and will reduce environmental concerns associated with herbicide application.

- Woody shrubs are a limiting factor in the full development of large areas of grazing land. Projects to develop practical means of control for wild rose, pasture sage, buckbrush, common tansy and ox-eye daisy were initiated in various areas of the province.

- Noxious weeds growing along riverbanks, canals and irrigation ditches are a very serious problem. Seeds are carried downstream and initiate new infestations. Permission to apply effective chemicals within 30 metres of water is very difficult to obtain. Efforts are being made to discover effective rates and methods of application of chemicals which might be more acceptable for application within this area.

PROBLEM WILDLIFE

Responsibility for prevention and control of wildlife depredation of crops and livestock remains with the producer, with assistance from the Municipal Agricultural Service Boards and A.S.B. Fieldman.

The Crop Protection Branch, Problem Wildlife Section, is responsible for a) supervision and coordination of provincial programs, b) extension, c) procurement and distribution of toxicants and control devices, and d) administration and implementation of portions of the Alberta Agricultural Pests Act.

The Problem Wildlife Section is comprised of a provincial supervisor, three regional supervisors, and four problem wildlife specialists. In addition, specialists were hired on a temporary basis to conduct coyote control in areas not easily serviced by permanent staff.

The Problem Wildlife Section is responsible for the supervision and coordination of three major programs: rat control, rabies suppression in skunks, and prevention and control of coyote depredation of livestock and poultry. In addition, the section provides extension services for the prevention and control of crop or livestock damage from field rodents (primarily pocket gophers and Richardson's ground squirrels), and nuisance birds (primarily magpies, blackbirds, sparrows and pigeons).

i) Rat Control

Alberta was kept essentially free of Norway rats for the 35th consecutive year. Rat control was conducted by the seven rural municipalities along the Alberta/Saskatchewan border in a control zone 30 km wide and 600 km long. The control program was conducted similar to previous years. A total of 8,105 inspections of farms, grain elevators and other premises were conducted by municipal and provincial pest control inspectors. Each premise was inspected from 1-3 times during the year. Infestations were eradicated by the cooperative effort of residents and government personnel.

The number of confirmed rat infestations in the control zone declined for the third consecutive year (Table 1). There were no known rat infestations in Alberta during August 1985. This was probably the first time that Alberta was truly rat free since the program began in 1950.

Within the interior of Alberta, suspected rat infestations continue to be reported by a concerned public. Most complaints were found to be muskrats, pocket gophers, wood rats or mice. Regardless, all suspected infestations were investigated by provincial and

municipal P.C.Is. Five rat infestations were confirmed within the interior of Alberta; two involved the keeping of rats by private individuals. Norway rats can not legally be held in captivity in Alberta.

Table 1. NORWAY RAT CONTROL ON THE ALBERTA/SASKATCHEWAN BORDER - 1985/86

Municipality	Bait Used		Inspection of Premises	Infestations		
	Dry (kg)	Water Soluble (L)		83/84	84/85	85/86
Bonnyville	428	0	1250	0	0	1
Vermilion River	2168	137	2593	33	45	23
Wainwright	650	150	999	8	7	0
Provost	2315	805	1520	86	29	39
Special Areas	1319	178	965	13	12	9
Acadia	397	41	208	1	1	0
Cypress	400	50	570	0	0	0
	7677	1361	8105	141	94	72

ii) Rabies Vector Control

The program to prevent the spread of rabies in Alberta, primarily in skunks, continued under the direction of the Central Rabies Control Committee.

Depopulation of skunks was conducted in conjunction with the rat control program along the Alberta/Saskatchewan border in the M.D. of Cypress, south of the South Saskatchewan River. Rabid skunks were taken in Saskatchewan within 10 km of the border east of the M.D. of Cypress. North of the South Saskatchewan River, skunk rabies was not reported closer than 160 km east of the border and consequently, no skunk control was conducted for rabies suppression.

Rabies was found in skunks in the County of Forty Mile in 1979 and spread westward into the County of Warner. Rabies was also found in the County of Newell in 1981. Skunks have been depopulated in these areas since then with traps and poison. Skunk rabies had not

been reported in the County of Newell since April, 1984, nor in the County of Forty Mile since 1982. Consequently, rabies control was terminated in these areas. However, two rabid skunks were confirmed in the County of Newell on December 11, 1985 and January 3, 1986.

Rabid skunks were reported in the County of Warner during January, February, July and December, 1984. However, control was terminated in the County of Warner in December, 1984, because known cases of rabies were sporadic and isolated. No skunk rabies was reported in the County of Warner until September 3, 1985 when a rabid skunk was confirmed near Coutts, less than 1 km from the United States border. Skunk depopulation was initiated and an additional five rabid skunks were taken in the area. A rabid skunk was also confirmed in the M.D. of Cardston on December 11, 1985, again within 2 km of the United States border. This is a disturbing development because it suggests that there is a focus of rabies in Montana immediately adjacent to Alberta. Montana has done no skunk control in the area. It appears that Alberta will have to continue to control skunks in the border area in the future for an indefinite period of time.

Bat rabies in Alberta continued to be low with only four confirmed cases in 1985. However, a man died of rabies after being bitten by a bat near Lesser Slave Lake. No medical attention was sought. This was the first known human fatality from exposure to rabies in Alberta. Confirmed cases of rabies in Alberta during 1979-85 are shown in Table 2.

Table 2. POSITIVE RABIES IN ALBERTA

	Skunks					
Year	Warner/Forty Mile	Newell	Elsewhere	Bats	Other	Total
1979	3	0	10	12	0	25
1980	53	0	1	11	1 cat	66
1981	22	1	0	9	1 dog	33
1982	14	29	0	7	1 horse	52
1983	27	3	2	5	3 cats	40
1984	4	3	0	5	1 dog	13
1985	6	1	1	4	1 human	13

iii) Coyote Depredation Prevention and Control

The primary objective of the coyote control program is to train producers to resolve their own problems with assistance from municipal agricultural fieldmen. Provincial problem wildlife specialists train agricultural fieldmen, assist with difficult cases and assist when fieldmen can not respond to requests for control.

Non-lethal preventive techniques such as electric fences and guard dogs are promoted. There are still relatively few producers who use electric fences, but within the last 2-3 years electric fences have been built in all regions of Alberta. Problem Wildlife staff assisted in the construction of 15 fences for coyote predation prevention in the last two years. Their use is certain to become an accepted and wide spread technique to prevent coyote predation in the future.

The program relies heavily on the judicious use of toxicants. Human safety is emphasized. In addition, the importance of proper placement of toxicants is stressed to minimize non-target poisoning of wildlife and domestic animals. Cyanide guns and strychnine baits were the primary toxicants used for coyote control (Table 3), although single lethal dose 1080 baits were registered for use in 1984. In comparison to strychnine, single lethal dose 1080 baits are more specific to members of the dog family and less hazardous to humans, wildlife and domestic animals. Thus, 1080 will probably replace the use of strychnine within the next few years.

Table 3. TOXICANTS DISTRIBUTED FOR COYOTE CONTROL

Year	Cyanide Shells	Strychnine Cubes	Single Dose 1080	Large 1080 Baits
1982	1642	3700	--	13
1983	1278	3593	--	16
1984	1175	4184	147	15
1985	873	2609	346	16

The number of cases of coyote predation handled by Agricultural Fieldmen remained about the same during 1984 and 1985. However, toxicant use decreased by 29 percent because fewer toxicants were issued per case (Table 4). This is a very positive change because toxicants are being used with more discretion, without reducing the effectiveness of the program.

Table 4. TOXICANTS ISSUED FOR COYOTE CONTROL BY AGRICULTURAL FIELDMEN DURING 1984 AND 1985

	Number of		
Year	Cases	Toxicants Issued	Toxicants Per Case
1984	520	4125	7.9
1985	528	2933	5.6

Sixteen 1080 baits were set during the winter of 1985/86, 15 within the M.D. of Cardston and 1 in the M.D. of Foothills. These baits were set to remove coyotes near sheep farms with a history of coyote predation. Cardston is the primary sheep producing area in Alberta.

Permanent wildlife staff investigated 234 cases of predation during 1985, most of which involved coyote predation of sheep and calves. In addition, personnel were hired on a daily basis as required to assist agricultural fieldmen with coyote control; these temporary staff investigated 39 cases of depredation (Table 5).

Table 5. NUMBER OF CASES OF PREDATION INVESTIGATED BY PROBLEM WILDLIFE STAFF, 1985

	Prey					
Predator	Sheep	Cattle	Hogs	Poultry	Other	Totals
Coyote	154	57	2	29	3	245
Dog	14	5	0	0	0	19
Wolf	2	1	0	0	0	3
Bear	1	3	0	0	0	4
Other	0	1	0	0	1	2
Totals	171	67	2	29	4	273

ENTOMOLOGY

a) Crop Insects

i) Grasshoppers

The grasshopper infestation level in 1985 was estimated to have been one third greater than the previous worst-recorded infestation, that of 1933 (Figure 1). A detailed spring survey of eggs and nymphs, the first since the late 1940s, provided the basis for weekly reports to farmers on the status of the grasshopper hatch.

A grasshopper control assistance program announced in June, paid farmers a rebate of 50 percent of the cost of grasshopper chemicals. Of the $6.6 million available for assistance, $3.2 million was paid out (Table 1). Eighty-three percent of the assistance went to Region I farmers. Total land area that could have been treated with the chemicals claimed in the assistance program was 860,000 hectares (assuming one application at median rates). In addition to severe infestations in the southern and central parts of the province (notably, Pincher Creek, Lethbridge, Claresholm, Vulcan, Standard), there was an unusually high grasshopper population in the Warburg/ Breton/Buck Lake area of Regions III and V.

Table 1. DISTRIBUTION OF GRASSHOPPER CHEMICALS, AND GRANT MONEY DURING 1985 GRASSHOPPER CONTROL ASSISTANCE PROGRAM

	Agricultural Region						
	I	II	III	IV	V	VI	Totals
Amount of Grant $	2,629,525	460,375	15,675	45,600	24,275	950	3,176,400
Litres of Sevin XLR	114,950	29,975	175	1,725	2,475	0	149,300
Litres of Furadan	104,450	17,650	325	225	1,125	0	123,775
Litres of Lorsban	70,375	3,075	0	0	0	0	73,450
Litres of Decis	21,000	3,475	300	975	25	25	25,800
Litres of Dimethoate	19,850	4,450	25	0	25	125	24,475
Litres of Others	16,825	10,925	350	200	1,025	0	29,325
Total Litres	347,400	69,550	1,175	3,125	4,675	125	426,050
Total Ha Sprayed	721,350	116,925	3,950	9,425	6,050	325	858,025

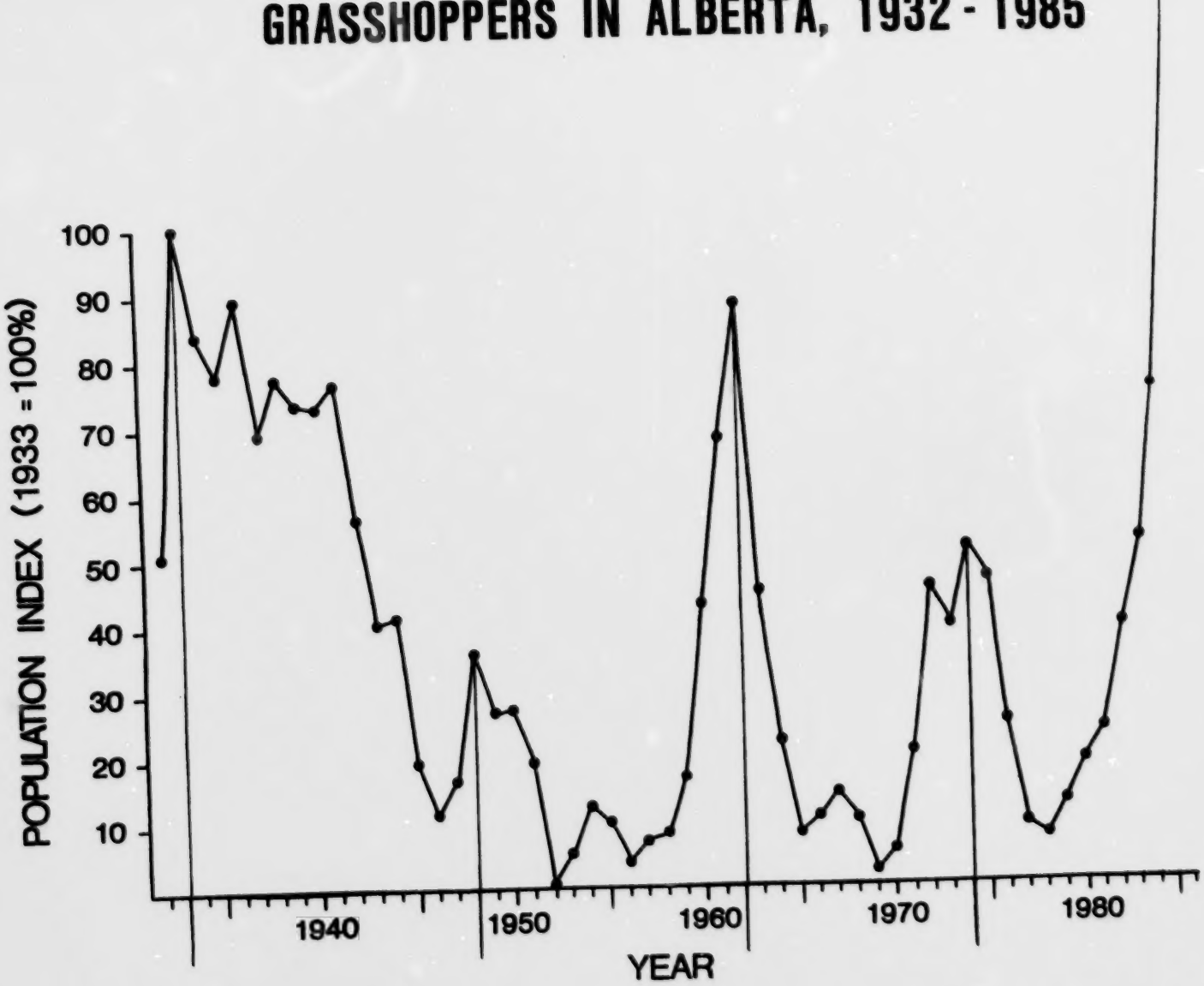
GRASSHOPPERS IN ALBERTA, 1932 - 1985
POPULATION INDEX (1933 = 100%)
100
90
80
70
60
50
40
30
20
10
1940
1950
1960
1970
1980
YEAR

Figure 1

Rain and cold weather in August and September reduced egg-laying activity of the grasshopper populations throughout the province. Lower egg densities were found during fall 1985 and spring 1986 surveys than were found the previous year. This indicates that although the area, forecasted to have moderate to very severe infestations in 1986, has increased (Figure 2) compared to last year's forecast map, the number of hoppers hatching is expected to decrease.

ii) Cutworms

Southern Alberta experienced the most severe outbreak of pale western cutworm since 1931. An estimated 50,000 ha of winter wheat and 4,800 ha of spring-seeded crops were lost. In all of Alberta, an estimated 100,000 ha were treated with insecticides, at least 20,000 hectares were reseeded, and crop losses plus insecticide costs were at least $13.6 million.

Province-wide, pheromone-trap monitoring of five moth species (bertha armyworm, redbacked cutworm, pale western cutworm, darksided cutworm and clover cutworm) was begun in 1985. A 13,000 sq km area in southern Alberta has been monitored with sex-pheromone traps for six cutworm and armymworm species for eight consecutive years. The two complimentary programs will provide information for predicting outbreaks in any agricultural area of Alberta.

iii) Oilseed Pests

Bertha armyworm infested 160 acres of canola around Grande Prairie and were sprayed.

Diamondback moth larvae were abundant in canola in the north-east and north-central regions. About 30,000 ha were sprayed with deltamethrin in the area bounded by highways 13 and 16 between Camrose and Vegreville to the west and the Saskatchewan border to the east.

1985 Grasshopper Forecast for Alberta

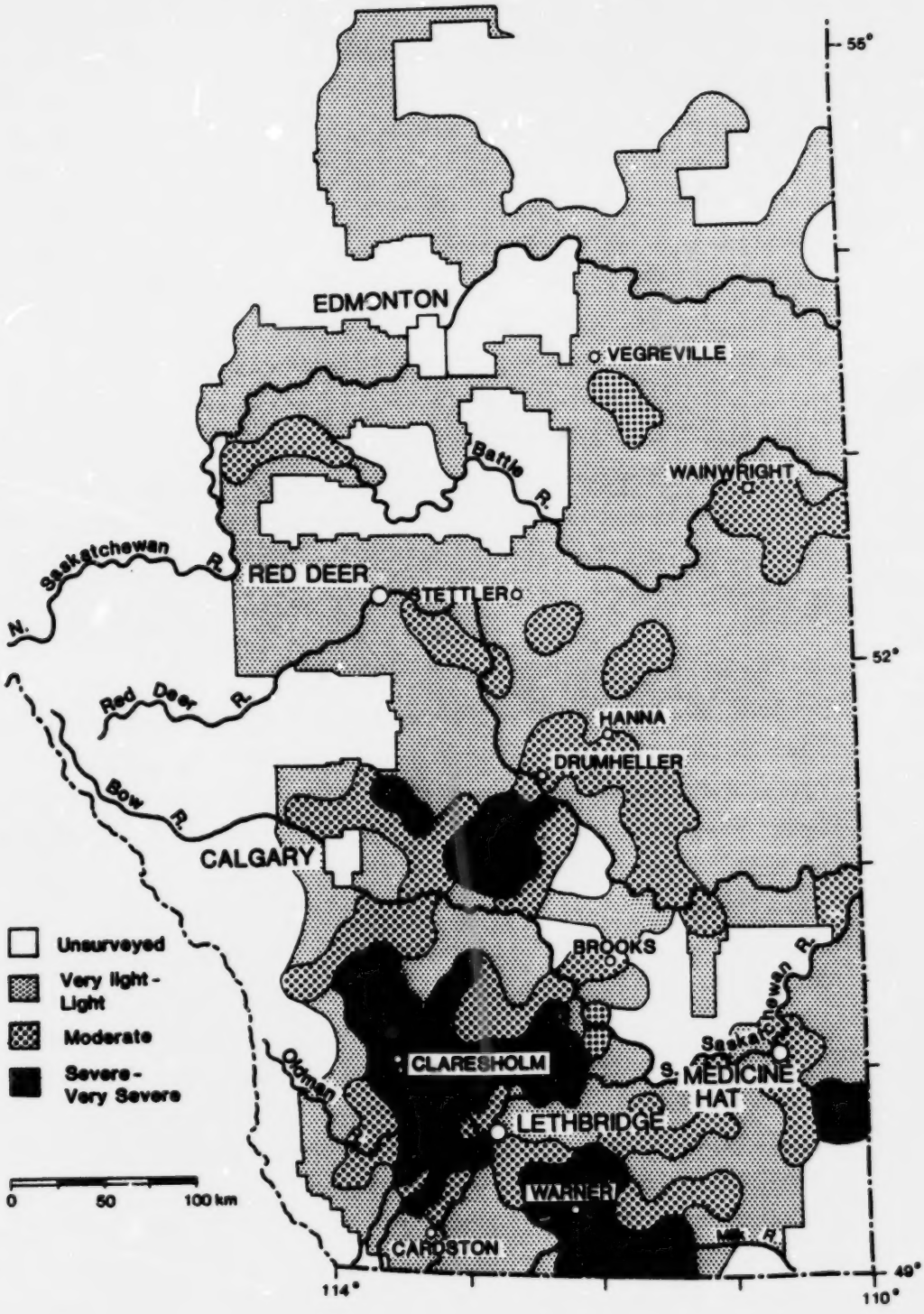

Figure 2

iv) Miscellaneous Pests

European corn borer moth populations increased 60 percent over last year's level as determined by pheromone trap catches. Moths were also found at Lethbridge and north of Taber this year; the bulk of the Alberta population is in the Medicine Hat/Bow Island area.

Alfalfa webworm were very abundant in some fields of second-cut alfalfa, many of which were harvested early as an alternative to insecticide treatment. A few fields of flax were sprayed for combined infestations of aphids, webworms and grasshoppers. Dimethoate gave good control of the aphids and grasshoppers but did not kill the webworms. Alfalfa webworm is not a common pest in Alberta. About 3,100 ha of seed alfalfa fields were sprayed for pest insect control, mostly alfalfa weevil and grasshoppers. Aphid control was needed on about 1,100 ha, 4 times the area treated in 1984.

APICULTURE

Honey production declined markedly in 1985 compared with the previous record year. Alberta's crop declined by approximately 9-10 million pounds over 1984. Most regions of the province experienced drought conditions with the exception of the Edmonton and north eastern regions. Extreme conditions were experienced in southern Alberta resulting in the substantial application of insecticides to combat the grasshopper outbreak. Insecticides were probably detrimental to beekeepers as many reports of damage were heard.

Wintering continues to increase with an estimated 90,000 hives being prepared in the fall of 1985. Unlike the previous year, beekeepers were on top of fall management. Initial reports indicate winter survival has been satisfactory. There is considerable interest in wintering indoors in the Peace region. To meet this interest, seminars were given with guest speakers from Manitoba and southern Alberta who are experts in this field.

Extension efforts continue to focus on self-sufficiency techniques. Commercial beekeepers' short courses were held at Fairview, February 1985 and Lethbridge, February 1986. Five wintering seminars were held in August 1985 and assistance was given to Olds College in presenting a queen rearing course.

The honeybee tracheal mite, Acarapis woodi, continues to spread throughout the United States. In an attempt to contain this pest the Canadian border from Ontario eastward was closed to the import of U.S. package bees and queens. U.S. bees require mite-free certification prior to entry into western Canada. To date surveys have not detected any mites in Alberta or other provinces.

The industry is still concerned regarding the eventual introduction of the Varroa mite, Varroa jacobsoni and Africanized bees. The latter are presently migrating northward through Central America and are expected to enter the U.S. between 1988 and 1994 at present migration rates.

Summer inspection staff examined approximately 16,000 hives in 1985 and found approximately 6.6% infected with American Foul Brood. This is the lowest incidence in 6 years falling from 30% in 1980. This level is comparable with other provinces but should be lower. Hopefully, one day the Crop Protection Branch will rate AFB as it does rats!

The Alberta Queen Rearing project continued to mature in 1985. Fairview College produced approximately 3,000 queens for sale and one Alberta producer is now producing queens using the stock. Two complete breeder sets sold to California breeders in 1985 made it possible to procure the stock early in the season, thus further benefiting the industry. A further set has been ordered in 1986.

Economics continue to be the major concern of the industry. The poor crop of 1985 resulted in the Alberta Beekeepers Assistance

program which granted commercial beekeepers operating in excess of 100 hives $15 per hive. Two hundred and fifty eight (258) beekeepers applied for assistance amounting to $2,439,180.00.

Changes to the U.S. Commodity Credit Corporation plan for honey in 1986 may result in decreased exports for Canadian honey. The modifications will encourage U.S. honey back to the U.S. market, a market that Canada and other countries were filling to a large degree. American Beekeepers were, and will be, encouraged to participate in the Advance Payment for Crops program, which is to their economic advantage. The price of wholesale honey rose from 45¢ to 55¢ per pound for 1985.

PLANT PATHOLOGY

i) Forage Crops

a) Verticillium wilt: The disease continues to spread in the southern region of the province (Census Division 1 to 6). The biggest increase in disease incidence occurred south of the Bow River where 16 of 37 fields surveyed had the disease compared to only 3 out of 37 fields in 1984. For the first time the disease was found in two dryland alfalfa fields. Both fields were located in C.D. 6, one northwest of Turner Valley and one south of Black Diamond, M.D. of Foothills. In C.D. 7 - 15, Olds to Peace River, the disease was not found in any of the 73 fields surveyed.

TABLE 1. VERTICILLIUM WILT OF ALFALFA IN ALBERTA (1985)

Census Division	Townsite	South of Bow River No. VW/Fields Surveyed	North of Bow River No. VW/Fields Surveyed
1	Bow Island/Medicine Hat	4/6	0/1
2	Lethbridge/Taber	6/10	3/7
3	Cardston/Pincher Creek	2/12	--
4	Hanna	--	0/8
5	Vulcan	2/3	--
6	High River	2/6	--
Total		16/37	3/16

b) Seed lots that are tested by Agriculture Canada and are free of seed borne Verticillium albo-atrum no longer require mandatory treatment with Thiram.

c) A verticillium wilt/bacterial wilt resistant alfalfa developed by Agriculture Canada, Lethbridge has been released for 1986.

d) Winter kill was serious in 1985. Dr. J. McKenzie (Beaverlodge) estimated a 26% loss of the total alfalfa acreage costing Alberta's dehydration industry some $4.5 million.

ii) Oilseed Crops

Seedling blight was serious only in the Peace region of Alberta. Drier than normal spring conditions in mid-May followed by general rains in early June caused a second flush of canola emergence - seed that had failed to germinate following the May planting due to dry soil conditions.

Dry weather conditions province-wide from late June to August resulted in trace to non-existent levels of sclerotinia stem rot. Disease forecast information to growers advised them against the need for spraying for this disease and less than 9,000 acres were sprayed province-wide. In contrast, wetter conditions in Saskatchewan resulted in 150,000 acres being sprayed for sclerotinia. In irrigated canola (70,000 acres), 16 of 23 fields surveyed had sclerotinia stem rot with an average disease incidence of 8.8%, but with some fields as high as 30% infection.

Root rot was the most serious disease on canola in the Peace Region with almost half of the fields showing moderate to severe damage. Elsewhere, sulfur deficiency symptoms were common but patchy in 10% of canola fields in central Alberta and scattered fields, particularly in the Westlock region, showed severe Glean damage.

The virulent strain of blackleg was confirmed in 12 of the 146 fields that were surveyed province-wide in 1985, up from 6 cases in 1984. Most confirmed cases (trace to low levels of infection) were in the Lloydminster/Vermilion region, although two instances were discovered in the Edmonton area. Both fields had trace infection levels. Blackleg, widespread in Saskatchewan, was estimated to have caused a 5% crop loss in that province in 1985.

iii) Cereal Crops

Survival of winter wheat, north of the traditional growing regions, was very poor to non-existent. Survival of winter wheat in the Edmonton/Vegreville region occurred only where the snow had come early in October and had drifted deeply - headlands and hollows. This indicates that snow moulds were not a factor, thus winter kill should be attributed to early and severe cold temperatures in mid-October. It is probable that several hundred thousand acres of winter wheat were lost due to the severe early cold spell in October.

Cereal leaf diseases particularly scald and net blotch of barley were apparent in early June. Build-up of these diseases did not occur in subsequent months, in most areas, due to the relative drought conditions that prevailed.

Loose smut was at less than trace levels (0.1%) in hard red spring wheat but levels of 5 - 7% were common in semi-dwarf wheats such as Oslo and HY320. All fields of barley had some loose smut with 50% of fields showing levels of 1 - 3% particularly in varieties such as Argyle, Empress, Diamond and Samson. Covered smut occurred at trace levels only in wheat, barley and oats.

Copper deficiency was diagnosed for the first time on barley growing on a sand/loam soil at Spruce Grove. This is additional to the copper deficiency diagnosed on barley growing on the Westlock region peat soils and Park wheat melanosis (copper deficiency) on sandy type soils.

Despite extensive testing at AEC Vegreville, no mycotoxins were found in any of the considerable amount of cereal grain that overwintered in the swath in the Alberta Peace Region.

iv) Potatoes - Bacterial Ring Rot

The Bacterial Ring Rot (BRR) program is operated and administered by the Crop Protection Branch, Plant Industry Division. Seven municipalities, funded through department grants, assist in the control program, and the Alberta Potato Commission cooperates by obtaining planting records and supplying lists of potato growers. The incidence of the disease in 1985 was well below the previous four year average. A contributing factor in the control of the disease was the use of certified seed by most commercial growers. There was an increase in levels of potato blackleg, and rhizoctonia remains a problem. No BRR was found in pedigreed seed fields and fair to good yields were obtained in most areas of the province. Frost, poor harvest conditions and losses in storage will necessitate the importation of additional seed stocks, particularly Norchip, for planting the 1986 crop. The volume of Alberta grown seed potatoes exported to the U.S. northwest continues to grow with an anticipated increase of nearly 30% over 1984 to a total of 11,000 tons.

TABLE 1. POTATO ACREAGE AND INCIDENCE OF BRR IN 1985

District	No. of Farms Inspected	No. of Farms Infested	Acres (Hectares) Inspected	Acres (Hectares) Infested	% Infested Farms	% Infested Acres
Peace River area	10	2	385 (155.2)	45 (18.1)	20.0	11.7
M.D. Sturgeon	17	3	2020 (814.5)	94 (37.9)	17.6	4.7
County Parkland	3	0	994 (400.8)	0 (0.0)	0.0	0.0
Edmonton Perimeter	5	0	328 (132.2)	0 (0.0)	0.0	0.0
Barrhead area	5	0	207 (83.4)	0 (0.0)	0.0	0.0
Vermilion area	17	1	973 (392.3)	6 (2.4)	5.9	0.6
Red Deer area	19	2	807 (325.4)	6 (2.4)	10.5	0.7
Calgary area	15	0	128 (51.6)	0 (0.0)	0.0	0.0
County Newell	20	4	3146 (1268.5)	530 (213.7)	20.0	16.8
M.D. Cypress	2	0	90 (36.2)	0 (0.0)	0.0	0.0
M.D. Taber	41	1	13554 (5463.3)	140 (56.4)	2.4	1.0
County of Forty Mile	7	0	856 (345.1)	0 (0.0)	0.0	0.0
County Lethbridge	11	0	351 (141.5)	0 (0.0)	0.0	0.0
Lethbridge Perimeter	35	1	291 (117.3)	2 (0.8)	2.8	0.7
Totals	207	14	24,132 (9,730.6)	823 (331.8)	6.7	3.4
1982-85 Average	201.5	15.7	20,509 (8.269.7)	882 (355.6)	7.8	4.3

Of the 207 potato farms inspected, involving 24,132 acres (9,730 ha), 6.7% of the farms and 3.4% of the acreage was infested with BRR. The incidence of the disease remains well below the four year average (1982-85) of 7.8% of farms and 4.3% of the acreage and with the trace levels in the fields, there is little economic loss to the grower.

There is reason to believe that with the continued use of pedigreed seed stocks by most growers (91% in 1984) the disease can be kept at very low levels, and hopefully eradicated in the foreseeable future.

Regulatory and Policy

The Agricultural Pests Act was revised in 1984 and the BRR regulations under the Act are at present still under revision. The Bacterial Ring Rot Review Board received no appeals in 1985. The seven (7) cooperating municipalities, with over 80% of the Alberta potato acreage under their jurisdiction, continued to play a significant role in the control program by supplying inspection staff, information, and where required, disinfection services to their growers. The Alberta Potato Commission cooperated by obtaining grower planting records and supplying lists of growers in the province.

For the fourth year, BRR trial plots for field observation were carried out at the Alberta Tree Nursery and Horticulture Centre in cooperation with Dr. S. DeBoer, Agriculture Canada Research Station, Vancouver, B.C. One of the trials in 1985 showed that cut tubers from several ring rot resistant varieties of potatoes with symptomless latent BRR, when held in contact with the cut surfaces of healthy susceptible disease free tubers, readily transmitted the disease. The ring rot resistant varieties continued to remain symptomless. These trials have shown over the past four years that several commonly grown varieties such as Russet Burbank can be infected with trace to low levels of the disease, maintain healthy vigorous top growth with no visible symptoms but still have BRR present in the stems and tubers. This is of great concern when related to the field inspection program for the control of the disease.

Alberta continued to be free of BRR in the 4,400 acres (1,775 ha) of pedigreed seed inspected by Agriculture Canada, up approximately 30% over 1984. One of their main objectives is the continued rigid inspection of seed fields and the encouragement of provincial BRR

control programs in order to eradicate this disease in Canada by the early 1990s.

v) Dutch Elm Disease and Fireblight

Alberta continues to remain free of D.E.D. and both species of vector beetles. Elm trees, particularly in the southern region showed some damage from the prolonged drought conditions. In Edmonton, a considerable percentage of mature Asian elms, up to 25% in some city areas, were winter killed. Despite the dry spring and early summer growing conditions, fireblight showed up in central Alberta in July. The disease was widespread only on apples and crabapples. Small fruiting spurs were primarily affected. Why this disease appears under drought type conditions is a mystery.

REGIONAL LABORATORY

i) Fairview

The regional crops laboratory provided a diagnostic, survey, extension and research service for Region 6 in entomology and plant pathology. A total of 274 specimens were processed (see Table below).

Summary of Specimens Submitted
Fairview
April 1, 1985 to March 30, 1986

Crop	# Disease Specimens	# Insect Specimens
Field Crops	67	8
Ornamentals	54	32
Shelterbelt	10	5
Vegetables	29	6
Fruits	9	9
Miscellaneous	15	30
	184	90

In 1985, disease surveys of canola, wheat, barley, alfalfa and potato fields were conducted in northern Alberta. The incidence and severity of all diseases were lower than normal. Generally, root and crown rots of all crops were the most serious problem.

Root rot was found in 96% of the canola fields surveyed but only 25% of the roots were severely diseased. Root rot was found with low incidence and severity in about 25% of the fields. Sclerotina stem rot was found in 9% of the fields, but severity was low. Four percent of canola fields had black spot and in one field, losses were of concern. The virulent strain of blackleg was not found.

All barley fields surveyed had a high incidence and moderate severity of root rot. Trace levels of scald in 36%, net blotch in 27%, tan spot in 24%, and loose smut in 6% of barley fields were seen.

Root rot was found in all wheat fields surveyed, usually at high incidence and moderate severity. Yellow leaf spot was found in one field at moderate levels. Glume blotch was found on at least 10% of the heads in 18% of surveyed wheat fields while sooty mold was found in 21% of the fields.

In the alfalfa fields, 75% had crown and bud rot, but only 50% of surveyed fields had more than 50% of the plants diseased. Leaf spots were seen in 58% of the fields, mostly at slight levels on lower leaves. Blackstem was found in 17% of the fields, but only 1 field had a severe problem. Verticillium wilt was not recorded in 1985.

Two potato fields had bacterial ring rot. Blackleg was found in 90% of the fields and severity varied from trace to severe. Trace levels of scab, Pythium leak, and Rhizoctonia canker were also recorded. Early blight was the most serious foliar pathogen being found on two fields at moderate levels.

PESTICIDE ISSUES

The Pesticide Issues Coordinator completed guidelines for handling major pesticide issues in the province. The guidelines were designed to expedite the resolution of such issues in order to minimize adverse affects.

Several pesticide issues arose outside the province and were dealt with by the Pesticide Issues Coordinator through contact with media reporters and by clarification of the issues.

The Branch disseminated information on pesticides to various groups such as farmers, doctors, students and the general public. This information was passed on through articles, seminars, press-releases and brochures. More than 50 articles were published in Alberta weekly newspapers, Farm Light & Power, Western Producer, Country Guide magazine, and Alberta Doctors Digest. Seminars were presented to pharmacy students and physicians.

Promotion of safe practices when using pesticides was fostered through seminars and workshops to farm groups and Alberta Agriculture staff. Brochures, displays, sticking posters, a slide/kit, etc. were updated to make them more understandable to Alberta farmers.

Contributions to pesticide matters were also made at federal/provincial and interdepartmental committees.

SOILS BRANCH

OBJECTIVES

1. To develop and promote improved soil management practices to increase crop productivity, farm income and prevent soil degradation.

2. To conduct research in the areas of i) soil fertility and fertilizers, ii) management of normal and problem soils (e.g., acidic, solonetzic, organic), and iii) soil, plant, and feed diagnosis and testing.

3. To transfer research technology to the farming public through extension and demonstration programs.

4. To transfer research information to private sector laboratories, agencies and agri-business to ensure producers have access to the latest technology and recommendations.

5. To provide diagnostic and routine soil, plant, and feed testing services for producers, staff, and researchers.

Grants of $341,403 were paid in 1985/86 to 87 applicants for the transport of 12,071 tonnes of lime and marl. A summary of the program since 1981 is provided in table 1.

TABLE 1. AGRICULTURAL LIME FREIGHT ASSISTANCE PROGRAM - SUMMARY

Item	1981/82	1982/83	1983/84	1984/85	1985/86
Number of applicants	64	100	141	81	87
Total grants ($)	166,313	378,787	601,657	302,743	341,403
Number of tonnes	4,707	13,211	21,764	11,697	12,071
Average grant per tonne ($)	34.88	28.64	27.64	25.88	28.28
Average grant per applicant ($)	2,598	3,780	4,267	3,738	3,924

Lower grants and applications were again the result of dry conditions combined with poor harvest weather.

b) ALBERTA FARM FERTILIZER PRICE PROTECTION PLAN (AFFPPP)

The purpose of the program was to assist Alberta farmers to reduce crop production costs particularly in reference to the current cost-price squeeze. Fertilizer can represent as much as 30 percent of the cash costs of crop production. The program was announced on April 1, 1985.

The program provided a grant to farmers on fertilizer used for crop production on land farmed in Alberta. Payment was based on $50.00 per tonne of nitrogen and $25.00 per tonne of phosphate. The program was in effect from August 1, 1984 to July 31, 1986.

During 1985/86 total grants of $21,232,005 were paid on 942,865 tonnes of fertilizer purchased. Grants were paid to 28,187 farmers based on 31,364 applications resulting in an average grant per farm of $753.

Soil, plant and animal feed analyses and recommendations were provided to farmers on a fee basis and to researchers and department staff on a non-fee basis as a diagnostic service and a contribution to crops and animal research. Total soil, plant and animal feed sample analysis were down to 39,099 from 43,204 in the previous fiscal year. The decrease was in research sample receipts while farm and diagnostic sample numbers were very similar.

ACTIVITIES

The branch continued to meet the demands of the farming public for information on fertilizer use, application, placement and timing. This was done through preparation of fact sheets, short courses, crop production seminars and the other media forms. Branch programs were developed to meet increased farmer demand for management alternatives to improve problem soils such as solonetzic, acidic, organic and luvisolic soils.

The branch also worked on a re-organization plan to increase emphasis on applied field research and laboratory analysis methodology. The plan was effective on April 1, 1986. Staff reacted positively to the development of the plan and revised roles.

During the year, R.H. McKenzie, Soil Specialist, Lethbridge took educational leave at the University of Saskatchewan.

a) AGRICULTURAL LIME FREIGHT ASSISTANCE (ALFA) PROGRAM

This program which provides transportation assistance to farmers for liming acid soils, has been in operation since 1981. A lime requirement test is used to qualify grants of 80 percent of the transportation costs above $5.50 per tonne of liming material.

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c) SOIL PRODUCTIVITY AND FERTILIZER USE

The main activities were extension and applied research related to soil and fertilizer management. A high demand for extension meetings continued as farmers seek methods of improving production efficiency to cope with very narrow cost/return margins. All aspects of fertilizers use efficiency, including handling and application, soil moisture conservation and nutrient uptake as affected by placement are being closely assessed by farmers.

Despite the concerns of high input costs and low crop prices, fertilizer sales increased marginally (Table 2). Nitrogen and phosphorus use increased by 5% and 4% respectively. There was very little change in fertilizer prices.

TABLE 2. FERTILIZER SALES IN ALBERTA

(By Analysis and Nutrient Content in Metric Tonnes)[1]

July 1 - June 30

Fertilizer	1982-83	1983-84	1984-85
82-0-0 (Anhy. Amm.)	163,650	187,337	181,075
34-0-0 (Amm. NO_3)	98,658	75,811	84,747
46-0-0 (Urea)	187,226	226,243	261,023
21-0-0 (Amm. SO_4)	19,096	16,757	21,607
Other N	2,301	3,603	7,526
28-0-0 (N. Soln.)	28,255	30,948	17,451
11-48-0 to 11-55-0	287,066	313,526	313,152
18-46-0		207	1,172
16-20-0	21,297	20,888	22,903
10-34-0	2,894	3,606	1,282
0-0-60 (KCL)	34,828	40,313	31,187
Others	10,289	5,249	3,041
Mixed (N/P/K)			33,489
TOTAL	855,560	924,488	979,655
Nitrogen (N)	303,815	335,906	353,649
Phosphorus (P_2O_5)	152,294	166,831	174,067
Potassium (K_2O)	21,267	24,900	21,024
Sulphur [2]	7,842	7,191	9,540
Ag. Lime	16,138	23,060	9,305

1. Source: Western Canada Fertilizer Association, Calgary
2. Alberta Agriculture

Sale activities of non-traditional soil amendments, fertilizers and growth regulators was high. Many of these products are not registered for sale and none of them have proven benefits to increase crop production under western Canadian conditions. Unfortunately, farmers become more vulnerable to the promotion of these products when they are looking for lower cost methods of crop production.

Field research was conducted on both dryland and irrigated crops to provide soil test calibration data for new crops and varieties, and to evaluate fertilizer materials and methods of application. Increasing fertilizer use efficiency is a high priority because of the influence of fertilizer on net returns from crop production. The annual fertilizer purchase in Alberta is about $300 million.

Variability in fertilizer recommendations provided by various soil testing laboratories continued to be of concern. Potassium, sulphur and micronutrient recommendations were made in areas where research indicates no need. Branch staff have been working towards providing extension information and to develop an accreditation program for soil testing laboratories.

i) Field Research - Southern Alberta

Irrigated Crops - A total of 32 field experiments were carried out at 7 locations testing fertilizer response on 14 irrigated crops. The experiments were designed for soil test calibration to determine optimum rates of application for nitrogen and phosphorus and to determine if potassium, sulphur and micronutrients were required. Research on corn, peas, beans and sunflowers was conducted jointly with Dr. R. Gaudiel, of the Alberta Horticulture Research Center, Brooks.

Good response to nitrogen was obtained with most crops. Dry weather and warm winds made it difficult to maintain optimum soil moisture during the growing season. Very wet weather during harvest also affected crop yields.

Generally, there was no response to P, K, S or micronutrients on any of the crops despite low soil tests for P and some micronutrients. The results show that present soil tests and deficiency criteria for micronutrients may not be valid on alkaline Brown and Dark Brown soils. This agrees with work in Saskatchewan.

Dryland Crops - Six plot sites were established in Southern Alberta on winter wheat, spring wheat, durum, HY-320 and canola. However, with very dry conditions, yields were low and there was little response to fertilizers.

ii) Field Research - Central and Northern Alberta

Annual Crops - Field experiments were conducted at 14 locations. Potassium experiments were continued at three locations to measure residual response to high rates of K applied in 1981 and to monitor changes in soil test K. The information from these experiments has been used in a potassium fact sheet and a "Western Canada Potash Handbook". The experiments continue to provide useful information on the K fixing properties of these soils.

A project to evaluate fertilizer response of barley and canola varieties, started in 1984 was continued at seven locations. Old and new varieties, fertilizer rates and methods of application were compared to update soil test calibrations. In general, response to fertilizer was more closely related to crop yield than to a specific variety.

The interaction between phosphorus fertilizer placement, soil acidity and subsoiling was studied at three locations.

Forage Fertilization Project - Results from many long-term forage fertilizer response experiments were summerized in this project. The purpose was to evaluate the effectiveness of nitrogen and phosphorus for improving forage yields and to relate yield response to soil tests and precipitation. Cooperators were Western Cooperative Fertilizers Limited, Lacombe Research Station, University of Alberta and Alberta

Agriculture. Experiments were representative of soils and climate for central Alberta and included 195 site years for alfalfa, grass-legume and grass forage. Alfalfa was found to be highly responsive to phosphorus and nonresponsive to nitrogen. The best response for grass-legume forage was obtained when both nitrogen and phosphorus were applied in combination. Grass was highly responsive to nitrogen fertilizer. Legume crop response to phosphorus was closely related to soil test available phosphorus levels and response of all crops increased with the supply of early growing season precipitation. Results from this project will be incorporated into fertilizer recommendations and yield predictions based on soil tests.

d) PROBLEM SOIL MANAGEMENT

i) Acid Soils

Yield results from a long-term liming trial in central Alberta are presented in Figure 1. An average annual yield increase of approximately 10.5 bu/ac was obtained from an application of 2.2 tons/ac of lime to a soil with an initial pH of 5.3. Soil test results have shown gradual acidification since the initial application of lime in 1970. In 1982, half of the original limed area was relimed and half of the original check area was limed for the first time. Further research is required to evaluate the crop response to reliming.

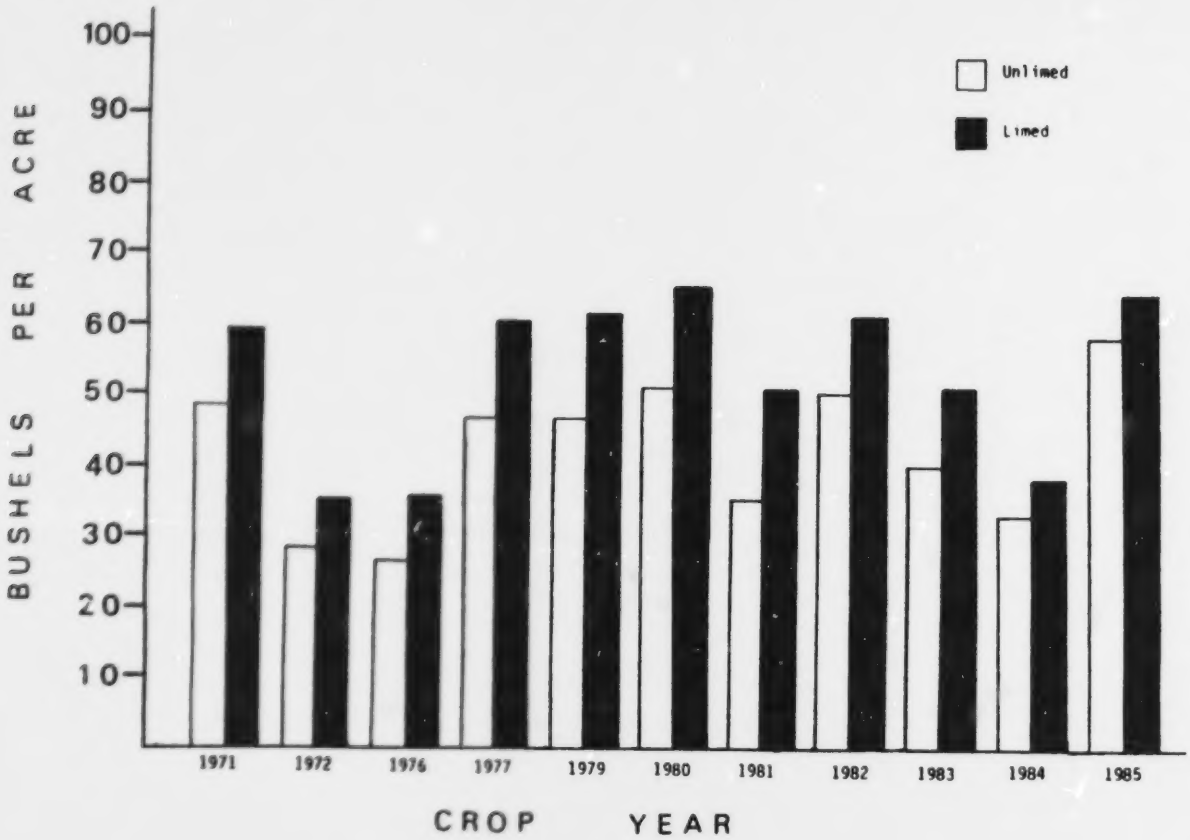

FIGURE 1: Yield of barley grain following lime application in 1970 of 2.2 tons/acre on an acid soil pH 5.3.

Two liming trials were established to compliment four existing trials. The objectives of these trials were to measure crop responses and to evaluate the effectiveness of different liming materials.

ii) Solonetzic Soils

Deep ripping or subsoiling as a technique for the improvement of Solonetzic soil was investigated by the Soils Branch. Twenty-nine plot sites were monitored to determine crop responses and to identify the soils most likely to respond to this treatment. Wheat response to subsoiling by soil zone is shown in Table 3.

TABLE 3. WHEAT RESPONSES TO SUBSOILING BY SOIL ZONE

Soil Zone	Yield Increase (bu/ac)
Brown	2.2
Dark Brown	5.7
Thin Black	5.5
Black	5.8

Subsoiling in combination with amendments such as lime and gypsum were also being evaluated. Trials involving gypsum and subsoiling were established in the counties of Paintearth, Minburn and Westlock. A subsoiling and liming trial, a multiple subsoiling and liming trial and a trial comparing two different subsoilers were established in the counties of Westlock, Paintearth and Stettler respectively.

A pilot-project was established in the Hanna, Coronation, Sedgewick and Stettler extension districts, whereby farmers would sample their fields, and submit the samples to a laboratory for analysis to determine the soil suitability for subsoiling. Further testing of this procedure is necessary before a program of this type can be available on a province-wide basis.

iii) Luvisolic Soils

In some luvisolic soils, a textural hardpan may be limiting water and root penetration of the subsoil. Six subsoiling trials were established in the counties of Smoky Lake, Leduc, Ponoka and Improvement District 18. Crop yields will be monitored to identify any improvement in crop growth.

e) LABORATORY SERVICES

The branch operates the Agricultural Soil and Feed Testing Laboratory (ASFTL) which has four major objectives:

- Provide an analysis and recommendation service for soils, plants and animal feeds to the general public on a fee basis;
- Provide diagnostic and investigational services for Alberta Agriculture on a no-fee basis for special soil, plant and animal feed problems, and to demonstrate improved technology;
- Conduct applied research to delineate major problems in crop and animal production, and where possible, to initiate and cooperate in projects to solve them; and
- Compile and summarize analytical data for recommendations and diagnostic use.

i) Analyses Services

Table 4 shows that during the fiscal year 1985/86 the ASFTL analyzed a total of 39,099 samples. Of these 18,235 were soils, 17,800 were feed and plant materials and 3,064 were horticulturally (greenhouse/garden) related.

Comparison of the 1985/86 data with the 4 year averages shows that, with the exception of producer soils, there is a stabilizing trend in sample submissions. The marked difference between the 1985/86 producer soils submissions and the corresponding 4 year average could be a result of reduced 1985 fall sampling due to early snow and freezeup.

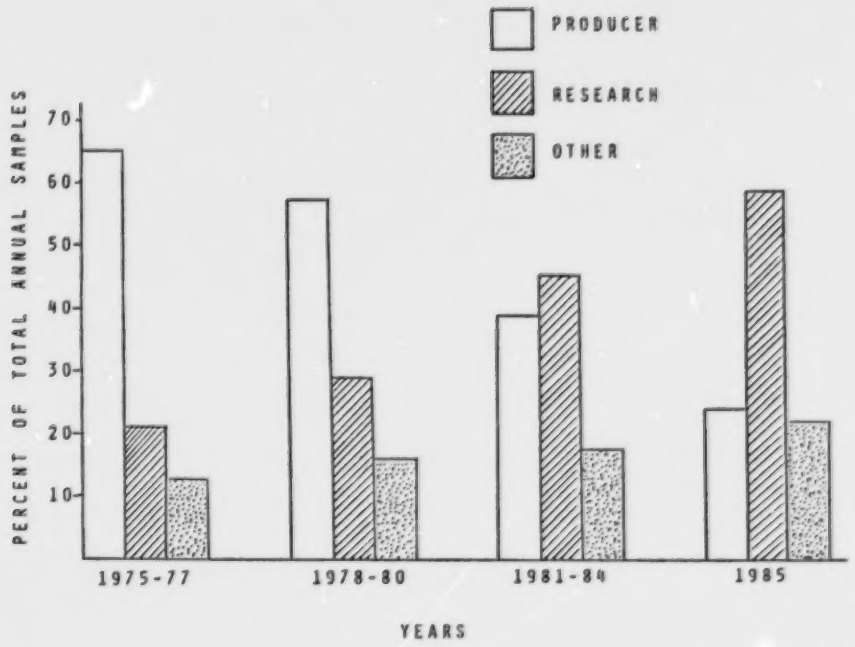

FIGURE 2. Producer, Research, and Other Samples as Percentages of Total Annual Soil Samples for Specified Periods.

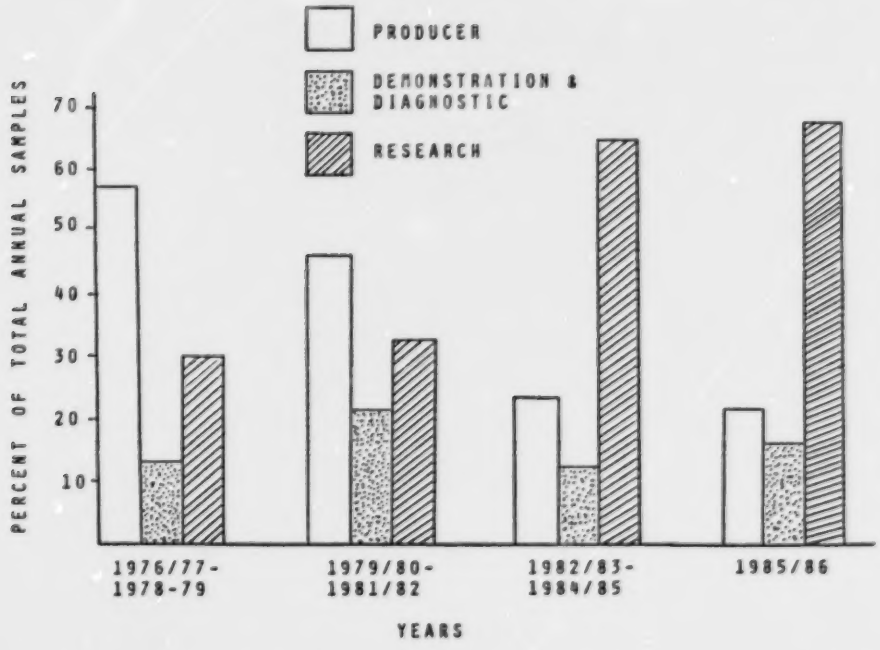

FIGURE 3. Producer, Research, and Demonstration and Diagnostic Samples as Percentages of Total Animal Feed and Plant Material Samples for Specified Periods.

Table 5 provides a summary of submitters and their use of the Demonstration and Diagnostic Service for 1985. District Agriculturists/ Fieldmen were the major users with over 40% of submissions for both soils and feed and plant materials.

Figures 2 and 3 give graphical representation of the sample categories for soil and feed and plant materials respectively as percentages of total annual samples for specified periods. The decline in percent of producers submissions and the marked increase in percent of research submissions is clearly obvious and is in accordance with branch objectives.

ii) Research Services

The research program of the ASFTL is designed to assist soils, crops and animal specialists and other researchers on a project basis. In this program applications for research project analyses are evaluated by the laboratory. Acceptance is based on the project meeting the specified objectives and guidelines of the branch, and the capability of the laboratory to conduct the particular analyses requested. Table 6 lists the research projects during 1985.

There were 80 projects in total, of which 50% were from Alberta Agriculture, 22% from Agriculture Canada, 19% from the University of Alberta and 9% from private industry and other agencies. These projects yielded valuable base data for a wide range of provincial applications which include:

- soil and crop management practices
- updating soil analysis recommendation programs
- crop related evaluations
- organic soils micronutrient requirements
- animal feeds preservation, nutrient status and evaluation
- animal feeding management practices

TABLE 4. NUMBERS OF SAMPLES ANALYZED IN 1985/86 AND PREVIOUS FOUR YEARS AVERAGES.*

Sample Category	Feed & Plant Soils		Materials		Greenhouse/ Garden		Total	
	4 Yr Ave.	1985/ 1986	4 Yr Ave.	1985/ 1986	4 Yr Ave.	1985/ 1986	4 Yr. Ave.	1985/ 1986
Regular Produce	10,046	5,992	3,784	3,566	2,048	2,639	15,878	12,197
Demonstration and Diagnostic	2,007	1,940	2,261	2,305	247	425	4,515	4,670
Research	11,969	10,303	10,057	11,929	--	--	22,026	22,232
Totals	24,022	18,235	16,102	17,800	2,295	3,064	42,419	39,099

*Data Based on Fiscal Year - April 1 to March 31

TABLE 5. SUMMARY OF THE SUBMITTERS AND THEIR USE OF THE DEMONSTRATION AND DIAGNOSTIC SERVICE FOR 1985.

Submitter	% of Total Submissions	
	Soils	Feed & Plant Materials
1. District Agriculturists/Fieldmen	42	41
2. Regional Specialists	12	17
3. Headquarter Specialists	9	5
4. Laboratory Staff at A.S.F.T.L.	28	33
5. Other Specialists	9	4
Total Samples	1987	2354
Number of Reports	445	905

iii) Data Compilation, Processing and Analysis

No changes were made to the laboratory's routine soils and feed sample data processing and report generation system. Substantial use was made of the data entry functions and data analysis capabilities of branch and government computing facilities for research projects. This included:

- Completion of the Alberta Soil Information System (AltaSIS) database in cooperation with the Land Resource Research Institute in Ottawa. This database includes data for: non-irrigated annual crops (481 site years); forage crops (539 site years); and Breton plots (53 years).

- Completion of the Forage Fertilizer Management project using AltaSIS; a cooperative effort by the Soils Branch the Department of Soil Science (U. of A.), Western Co-operative Fertilizers Limited and the Lacombe Research Station of Agriculture Canada.

- Development and testing of a model for crop response to fertilizer and moisture using AltaSIS database.

iv) Soil Test Recommendation System

The objectives of this project was to develop a computerized system to provide agricultural soil test recommendations for making cropping and fertilizer decisions for Alberta. QRD Systems Consultants were contracted to conduct a Systems Requirement Definition (SRD) and a Systems Design Alternative (SDA) to determine the needs of various potential users and compare various designs. Results of QRD's study indicated that a computer system be developed on the central site mainframe to (a) satisfy the needs of the Agricultural Soil and Feed Testing Laboratory, and (b) be accessible to various extension networks. Extension of the system to private laboratories may be delayed and possibly developed at a later time once demand dictates such action.

The Systems Management Group gave full approval for the development of the Soil Test Recommendation System. QRD Systems Consultants were again contracted in January 1986 to perform the Development Phase. This phase is now in process of development.

Table 6. SUMMARY - 1985 RESEARCH PROJECT ANALYSIS PROGRAM

Project Number	Name of Researcher and Project Title	Sample Volume	
		Soils	Plants and Feeds
85-054	George Clayton, Can. Ag. Ft. Vermilion Conservation tillage practices for cereal and oilseed crops in the lower Peace River Region		93
85-055	D.C. Penney, Alta. Ag. Soils Br. Soil test calibration for crops and varieties (barley and canola)	136	704
85-056	Dave McAndrew, Can. Ag. Vegreville Reduced tillage systems of N.E. Alberta	1585	
85-057	Dave McAndrew, Can. Ag. Vegreville Crop rotations for solonetzic and associated soils	665	
85-058	M. Nyborg, U. of A. Soils Soil sampling for soil test N	204	
85-059	Gerard Hoppe, U. of A. Pl. Sci. A study of defoliation frequencies in relation to the management of grass-legume mixtures Part I		45
85-061	Dr. Walter Leps, Res. Council Edmonton Isolation of low temperature tolerant rhizobium meliloti	127	
85-062	Dr. J.A. Robertson, U. of A. Soils Breton plots annual soil analysis	304	
85-063	Ross McKenzie, Alta. Ag. Lethbridge a) Dev. of fertilizer recommendations for irrigated crops in Alta. b) Update of fertilizer recommendations for dryland crops in S. Alta.	542	2834
85-064	R.C. McKenzie, Alta. Ag. Brooks Moisture & nitrogen storage in fallow and stubble	296	
85-065	R.C. McKenzie, Alta. Ag. Brooks Water use of alfalfa, seed alfalfa and canola	18	24
85-066	R.C. McKenzie, Alta. Ag. Brooks Reclamation of levelled land	42	

Table 6 (Continued)

Project Number	Name of Researcher and Project Title	Sample Volume	
		Soils	Plants and Feeds
85-067	R.C. McKenzie, Alta. Ag. Brooks Winter wheat production as a means of reducing summer fallow	28	
85-068	R.C. McKenzie, Alta. Ag. Brooks Water use of 3M wheat, soft wheat and hard wheat and the relationship between water use, nitrogen requirement and milling quality	144	411
85-069	V. Baron, Ag. Canada Lacombe Development of NIR technology		1054
85-070	David Sippell, Alta Ag Reg Lab Fairview Predisposition of rapeseed to root rot	34	51
85-071	Dr. R.S. Sadasivaiah, Ag Canada Beaverlodge Development of canola varieties for the Peace River Region	106	
85-072	John V. Christensen, Canola Council Grow with Canola - farm demonstration	39	
85-073	Peter Jones, B.C. Ag. Courtney Dry matter and nutrient yield of two forages harvested at three stages of maturity		147
85-074	P.C. McKenzie, Alta. Ag. Brooks The effect of nitrogen and other fertilizers on the yield and quality of potatoes grown at two levels of irrigation	159	
85-075	A. Van Deurzen, Alta. Ag. Lethbridge Western Irrigation District water use efficiency	90	
85-076	Garry R. Coy, Alta. Ag. Fairview Soil pH variability study	712	
85-077	Jerome Lickacz/Doug Penney, Alta. Ag. Soils Br. Liming acid soils	176	
85-078	David Buck, Alta. Ag. Pl Sci. Fairview Forage improvement by use of plant growth regulators		611

Table 6 (Continued)

Project Number	Name of Researcher and Project Title	Sample Volume	
		Soils	Plants and Feeds
85-079	R. Bjorge/R. Carlyon, Alta. Ag. Westlock Response of barley on peat soils to copper applications	41	12
85-080	Delbert Degenhardt, U. of A. Pl. Sci. Fababean cultivar trial	154	
85-081	Darryl Wells, Alta. Ag. Valleyview Community Pasture Fertilization	16	62
85-082	Darryl Wells, Alta. Ag. Valleyview Fertility practice effects on yield and quality of legumes plus cereals and oilseeds in rotation	51	
85-084	Dale ZoBell, Alta. Ag. Red Deer Trace mineral levels of central Alberta pastures	43	103
85-085	Sam Jaikaran, Alta. Ag. ASFTL Canola meal as protein supplement in swine rations		4
85-086	Sam Jaikaran, Alta. Ag. ASFTL Reproductive performance of sows and gilts fed canola meal		50
85-087	M. Nyborg/D. Penney, U. of A. Soils Sulphur oxidation rate in soil	389	
85-088	Gary Mathison, U. of A. Anim. Sci. Feed evaluation unit		188
85-089	Pat Ramsay, Alta. Ag. Wetaskiwin Hay show		41
85-090	Dianne Westerland, CARA Oyen Various (5) projects	239	239
85-091	S.S. Malhi, Ag Canada Lacombe N & P fertilization of forages	57	2056
85-093	S.S. Malhi, Ag Canada Lacombe Fertility recommendations for zero tillage and feasibility of zero tillage on central Alberta	720	

Table 6 (Continued)

Project Number	Name of Researcher and Project Title	Sample Volume	
		Soils	Plants and Feeds
85-094	S.S. Malhi, Ag Canada Lacombe Increasing efficiency of fall-applied N under various tillage and straw management systems	1170	31
85-095	L.J. Piening, Ag Canada Lacombe The role of copper in stem melanosis of Park and other wheat cultivars	431	258
85-096	Dr. Bob Hironaka, Ag Canada Lethbridge Selenium/sulphur ratios in beef cattle hair samples		66
85-097	J. Harapiak/N. Flore, WCFL Calgary Fertility studies on cereals and forages	339	
85-098	Brian West, Alta. Ag. Red Deer Manure utilization study using a travelling gun on intensively grazed forages	24	
85-099	Dr. Felix Mederick, Alta. Ag. Lacombe Agronomic research in barley & triticale	18	90
85-100	Dr. C. Wayne Lindwall, Ag Canada Leth. Evaluation and development of furrow openers for seed and fertilizer placement under minimum tillage conditions	390	
85-101	Janette MacDonald Adam, Alta. Ag. Leduc Alfalfa booster contest		24
85-102	G. Mathison/D. Engstrom, U. of A. An. Sci. Effect of beta-glucans in barley on ruminant digestion and metabolism		93
85-103	L. Bauer/J. Lougheed, U. of A. Ag. Ec. An economic evaluation of tillage management systems in the dark brown soil zone	40	130
85-104	A.W. Goettel, Alta. Ag. Soils Br. Management and improvement of alkali soils in northeastern China	45	
85-105	Don Wentz, Alta. Ag. Lethbridge Soil salinity-cropping studies, A) On-farm demonstrations, B) Economic survey	65	

Table 6 (Continued)

Project Number	Name of Researcher and Project Title	Sample Volume	
		Soils	Plants and Feeds
85-106	R. Courtney/W. Wishart, U. of Calg. Env. Effect of burning on native range feed quality		60
85-107	Ken Lopetinsky, Alta. Ag. Barrhead Comparison of 2 hay preservatives on alfalfa round bales		32
85-108	David M. Gibson, U. of A. An. Sci. Sulfur dioxide as a preservative for high moisture barley in livestock rations		33
85-109	J. Lickacz/E. Kastelic, Alta. Ag. Soils Solonetzic soils deep tillage feasibility study	367	
85-110	Darryl Wells, Alta. Ag. Valleyview Valleyview total beef program (TBP)		41
85-111	Rod Carlyon, Alta. Ag. Westlock Variety demo plots		36
85-112	Henry Najda, Ag Canada Beaverlodge Rates of fertilizer application and the effects on grass seed production	146	
85-113	S. Smith/D. Filteau, Ag Canada Yukon Yukon crop development program	53	103
85-114	R. Labbe/J.A. Robertson, U. of A. Soils Agronomic, chemical and mineralogical aspects of potassium deficient soils of central Alberta	8	135
85-115	Don F. Salmon, Alta. Ag. Lacombe Spring triticale silage screening		60
85-116	Gordon Grant, Alta. Ag. Brooks Greenhouse lettuce fertility study	2	32
85-117	Nigel Fairey, Ag Canada Beaverlodge Management systems for grass legume forage crops in the Peace River Region	204	
85-118	Richard Pearen, Ag Canada Vegreville Nitrogen response curve and nitrogen fertilizer management for meadow brome-grass in Alberta	176	

Table 6 (Continued)

Project Number	Name of Researcher and Project Title	Sample Volume	
		Soils	Plants and Feeds
85-119	Ken Ziegler, Alta. Ag. Rocky Mtn. House Feed analysis with cereal crop maturation		78
85-120	Dr. Marvin Nyborg, U. of A. Soils Soil sampling for soil test N, P, K, S	180	
85-122	Y.K. Soon, Can. Ag. Beaverlodge Mountain Trail and Beaverlodge Research Station rotation plots	50	
85-123	J.A. Robertson, U. of A. Soils Factors affecting P fertilizer utilization in tilled and untilled soils	276	
85-124	J.A. Robertson/D. Pennev, U. of A. Soils Factors affecting K availability	167	
85-125	G. Grainger/H.T. Oosterhuis, Alta. Ag. ATN Nutrient study of woody plants	66	
85-126	Y.K. Soon, Ag Canada Beaverlodge Crop residue management on a gray luvisol	48	
85-127	S.S. Malhi/B. Berkenkamp, Ag Canada Lacombe Fertilizer practices for annual forages		1217
85-129	J. Harapiak/N. Flore, WCFL Calgary Chloride levels in plant tissue		152
85-130	Rob Hand, Alta. Ag. Barrhead Feed wastage from large round bales		79
85-131	Sam Jaikaran, Alta. Ag. ASFTL Chemical analyses of canola meal from prairie sources		22
85-132	Dr. Ray Fenton, Alta. Ag. An. Health Evaluating the effect of an increased dietary selenium level on the health and performance of cattle at a southern Alberta feedlot		56
	Total	11,382	11,557

FIELD CROPS BRANCH

OBJECTIVES

- 1. To develop new, high yielding varieties of barley, winter wheat, winter and spring triticale adaptable to Alberta.

- 2. To obtain performance and adaptability information on new and recommended cultivars of barley, wheat, oats, canola and flax.

- 3. To evaluate varieties and agronomic practices of barley, wheat and triticale for high moisture grain production.

- 4. To promote adoption of varieties and management practices to improve cereal and oilseed production in Alberta.

- 5. To provide seed technology to improve pedigreed seed production.

- 6. To promote adoption of forage varieties and management practices on rangeland and tame forage crops to improve forage production in Alberta.

- 7. To study the economic and agronomic advantages of special (alternative) crops in Alberta and to obtain performance and adaptability information on possible alternate crops, in order to make variety and production recommendations. To develop the agronomic technology necessary to produce viable seed from alternate crops.

- 8. To administer the guidelines for assistance to the Municipal Co-op Seed Cleaning Plants in Alberta.

- 9. To provide assistance to other sectors of the Department, agencies, and the agricultural industry.

PROGRAM SUMMARIES

The Branch has just completed an exceptionally busy year of producer meetings. There is great interest in "intensive crop management", especially in cereals. Seminars were held to review the criteria for I.C.M. and agronomy trials have been initiated to establish guidelines to recommend for Alberta conditions.

The Branch has been involved in agronomy outside of Alberta. Work continues on range improvement in Heilongjiang Province in China, and rapeseed production in India.

Nine forage associations provide an excellent opportunity to service forage producers and to intensify pasture use. Seventy-seven municipal co-operative seed cleaning plants processed 27 million bushels of seed during the year.

Upgrading grants totalling $552,767 were issued to fifty seed plants. A replacement grant totalling $450,000 was used to assist in the building of a new seed plant at Vermilion.

A new "Winter Wheat Production" manual was produced. The Canola Breeding Project, a joint program between Agriculture Canada and Alberta - Farming For The Future continues to progress towards regionally suitable varieties for northern Alberta and the irrigated and dryland areas of southern Alberta.

Pedigreed seed production in Alberta totalled 200,000 acres by 1,012 seed producers. The Branch supports the pedigreed seed shows in Lethbridge, Calgary, Edmonton and Grande Prairie. A seed technology seminar at Olds College continues to be well attended each November.

The Crop Research Section developed a new 6-row feed barley, BT518, and its first spring triticale, T44. They will be released in 1987 to select seed growers, as breeder seed. An additional 135 acres were purchased and added to our research farm at Lacombe. We

received $25,000 for royalties on seed sales and $36,000 for the sale of Samson seed barley. We continue to use winter nurseries in Oregon and California.

Field peas, lentils, fababeans, dry bean, confection sunflower, grain corn, mustard, alfalfa seed, and wild rice are special crops that the Branch services. A Farming For The Future project was initiated at four sites in central Alberta to review the agronomy and adaptation of field peas, fababeans and lentils.

ACTIVITIES

a) CEREAL CROPS

The publication 'Varieties of Cereal and Oilseed Crops for Alberta' was revised, updated and distributed through the "Country Guide" and District Offices. The information presented in this publication is based upon our extensive regional variety testing program to aid farmers in selecting the most suitable varieties for their areas.

A manual entitled "Winter Wheat Production" was prepared and published.
The manual incorporates research information with the practices of top producers as revealed through survey results, into a complete production package for winter wheat production.

The major extension demand this year was on barley, winter wheat, hard red spring wheat and semi-dwarf wheat and barley production. Interest has greatly increased on I.C.M. procedures.

b) MUNICIPAL CO-OPERATIVE SEED CLEANING PLANTS

Seventy-seven municipal co-operative seed cleaning plants processed 27 million bushels of cereal grain and oilseeds for the year ending June 30, 1985. This amount was down 4 million bushels from last year, but only 2 million bushels below the five-year average.

The following table shows the amount of seed processed in 1985.

General Summary (Bushels)	1985
Total cleaned for Commercial Seed	23,778,140
Total cleaned for Pedigreed Seed	1,654,260
Total cleaned for SEED	25,432,400
Total cleaned for Dockage Removal	1,533,856
TOTAL PROCESSED	25,966,256
Average grain processed per plant, 1985	351,000
Five-year average grain processed per plant	384,000

There were fifty seed cleaning plant grant applications, eight more than last year, under the Upgrading Program. These fifty totalled $1,460,240 expenditure by the plants, and $552,767 of provincial grant money. This compares to 42 grant applications totalling $992,435.30 of expenditure and $578,140.47 of provincial grant money last year. The average grant paid in 1985 was $11,055.34, compared to $8,961.76 paid last year.

One new seed cleaning plant was completed in 1985-86 at Vermilion costing about $1.1 million. Stony Plain, Carstairs and Dawson Creek plants are in various stages of replacement. Leduc moved their plant to a new site west of town and received a major upgrading at the same time. Future plants planning on replacement are Willingdon in 1987-88, Rycroft in 1988-89, and Three Hills in 1989-90. Our Provincial Replacement Program provides technical and financial assistance to these plants, each of which will cost about $1.1 million.

c) OILSEED CROPS

Principle activities were directed towards technology transfer through media releases and presentations, field tours, production meetings, training sessions with extension, crusher and other industry field representatives, and individual contacts. Numerous articles and materials were prepared and assembled for regional and

district staff, educational institutes and commodity groups. Growers and industry were very supportive of these activities.

Direction and assistance was provided to the Canola Council of Canada's 'Grow With Canola' program. Resource staff participated in the development of production-orientated videos and programs for technology transfer purposes ("A Better Way" video on sclerotinia stem rot disease; "Canola Production" video for extension meetings, and "Canola Production Update" for the Prairie Farm Report) and as speakers at Grow With Canola fairs, and update seminars for industry and government representatives. Input and direction was provided to the planning and development of on-farm demonstrations throughout western Canada, handled by four Grow With Canola agronomists, two of which were located in Alberta. The agronomists developed 19 sites in Alberta, most of which demonstrated yield increases through management changes over the normal production practices of the co-operating growers. These on-farm demonstrations were viewed by several thousand growers and industry people. Assistance was provided to growers in initiating and forming Canola Clubs in various areas of the Province.

Input and direction was provided to the Grow With Canola program on seven agronomic research projects which enhanced knowledge on sclerotinia stem rot forecasting and control, low temperature germinating varieties, seedling blight disease, tillage and seeding practices.

Close liaison was maintained with oilseed organizations, crushers and exporters to facilitate communications within the oilseed complex and provide resource information. Two Alberta Canola Industry meetings were held to discuss the common concerns of the canola industry with crushers, grain handlers, producers, seed growers, and government.

Close liaison was maintained with Agriculture Canada regarding the Canada/Alberta Canola Breeding Project at Beaverlodge, Lethbridge and Saskatoon, as well as other Farming For The Future, Federal, and

University oilseed research projects. The Canola Breeding Project continues to develop progressively towards regionally suitable varieties for northern Alberta and for southern Alberta irrigation and dryland.

Resource staff participated in a U.S.A. Rapeseed/Canola Mission as well as a Pacific Northwest Rapeseed Conference to evaluate U.S. production potential and the short and long-term implications to Canada's canola industry. Other out-of-country project involvement was with the India/Canada Oilseed Agreement in which three India representatives studied Canadian extension methods on oilseed crops.

d) SEED TECHNOLOGY

The Alberta Branch of the Canadian Seed Growers' Association experienced another gratifying year. Although they experienced a reduction in membership to 1,012, inspected acreage stayed at over 200,000 acres.

Agriculture Canada is actively pursuing the cost recovery concept. The proposed 25¢ increase for inspection fees was not incorporated for 1985, but will be applicable in 1986. Costs for seed testing, seed sealings, tags and other areas have also been increased. As well, authorized establishments will now be subjected to an annual fee.

The Alberta Stock Seed Distribution Committee handled approximately 70 applications in 1986. Forty-six of these applications were granted probationary status.

SeCan membership remained strong at approximately 2,400 members. Alberta has 575 members. SeCan varieties now account for 60% of the inspected acreage. One regional SeCan meeting was held in the province.

The third annual Pedigreed Seed Show, held in Edmonton, had 238 exhibits in 1986. This was down 12 from 1985. Given the poor fall of 1985, the exhibits were of good quality. Ag-Expo in Lethbridge held another successful show as did the Calgary Seed Fair and Hay Show. This was the first spring show for Calgary in many years. Grande Prairie also had a successful seed show in March. There was an excellent response to their first major seed show. The pedigreed seed display was exhibited at these major fairs, as well as numerous smaller fairs throughout the province. Assistance was provided to people entering samples in the Toronto Royal Winter Fair. Nineteen-eighty-five will be the last year that Alberta Agriculture sends samples to Toronto on behalf of the producers. The Alberta Branch of the Canadian Seed Growers' Association again hosted the Probationary/Select Workshop in Lacombe, as well as various field days.

The Seed Technology Workshop held at Olds College was again well received. The various representatives of the seed industry were very supportive of this event.

The Alberta Branch of the Canadian Seed Growers' Association maintained liaison with the respective commodity groups and associations. Calgary was the site of the 1986 Annual Meeting, which attracted 175 members and guests. The Alberta Branch also participated in the Seed Growers' Association and the Canadian Seed Growers' Association/Canadian Seed Trade Association Interprovincial Meetings.

The Canadian Forage Seed Project handled 99 applications. The Project distributed 10,425 kg of Foundation seed. In addition, 7,632 kg of Foundation seed was demoted to Certified and allocated to the successful tender. Discussion of disbanding the project in five years are taking place.

Assistance was provided to all regional and district staff as required. This assistance was also made available to commodity

groups, associations, Agriculture Canada, universities, colleges, and the farming public.

e) FORAGES

The Forage Section continued to emphasize extension programs including presentations at numerous producer meetings. Extension programs continued with co-ordinated efforts through forage associations. The Battle River Forage Association was organized in the Camrose/Ryley areas, making a total of nine forage associations in the province. The Foothills Forage Co-operative Association re-organized following a year of decreased activity. The forage associations continue to have strong local programs including demonstration projects, especially pasture projects. Newspapers highlighting relevant information, field tours and winter seminars are major activities of the associations.

The Alberta Forage Institute sponsored a series of meetings on hay preservation and intensive hay making. Approximately 300 people attended meetings at Lethbridge, Olds, Vermilion, Stony Plain and Fairview.

The Alberta Forage Seed Council continues to be active. Programs include publishing Forage Seed Notes, liaison with the Forage Seed Trade, visit to Oregon regarding fescue seed production and marketing, seed production seminars, and displays at regional seed fairs.

The season got off to a poor start with winterkill of tame forage, especially alfalfa, being a common problem.

Drought conditions were prevalent throughout much of the province. The drought was devastating in the southern parts of the province from approximately Crossfield south with conditions worsening in the southern most parts. Central Alberta (west to east) and the Peace River area were also very dry. Only the Vermilion region and parts of the Barrhead region had weather which resulted in near normal

yields. Despite very low forage production feed shortages were not encountered during the winter livestock feeding period and hay prices were less than in 1985. This was due to a combination of factors including cereal crops salvaged for feed, reduced livestock herd size, a mild winter, and inexpensive cereal feed grains. The native range condition has degenerated during the recent drought years.

The Forage Section continued to be involved with the Qigihar Range Development Project in our sister province of Heilongjiang, China. A staff member worked in Heilongjiang for approximately one month. In addition to assisting in development of the Heilongjiang forage industry, Canadian forage varieties are being tested for possible export and Heilongjiang forage species are being tested under Alberta conditions. Heilongjiang provincial representatives visited Alberta on a return visit to make first-hand observations of our forage industry.

Forage seed supplies and prices were affected by the growing and market conditions in 1896. Dryland grass seed yields were much lower than long time average yields. Crested wheatgrass was affected the most and retail prices more than doubled compared to 1985. Bromegrass seed yields were less affected by drought and prices increased slightly. Creeping red fescue yields and acreage were below normal and retail prices increased by 50%. Timothy acreage was low due to recent high production. Timothy yields were well below normal resulting in retail prices rising 50%.

Alfalfa seed yields in Southern Alberta were normal while those in other parts of the province were below average. Retail alfalfa seed prices were up 20% from 1985. Alsike clover yields were low with overall production being one-half of normal and retail prices up approximately 40%. Red clover seed production was about one-half of normal and retail prices were 75% higher. Sweet clover seed yield was similar to 1985 while prices were up by 40%.

Numerous press and radio releases were made including the following:

1. Hay prices - How much should a farmer pay.
2. Feed shortages.
3. Dual purpose forage mixtures.
4. Spring management of tame pasture.
5. Timothy.
6. Crested wheatgrass seed shortage.
7. Tips on buying high quality forage seed.
8. Establishing productive alfalfa stands.

The following publications were prepared:

1. Varieties of Perennial Hay and Pasture Crops for Alberta, 1986, for the Alberta Forage Advisory Committee, released as a Country Guide insert.

2. Canadian Alfalfa Varieties, revised for the Alberta Forage Seed Council.

f) RANGE MANAGEMENT

The Range Management Section's principle activities were directed towards extension of technology through publications, field tours, news articles, publications and associations.

Extension activities included speaking at District Agriculturists' and Forage Associations' field days, organizing a Range Brush Control tour in the Special Areas and assisting the Suffield Grazing Advisory Committee, and the Chinook Applied Research Association. Other activities included the design of Shotgun mixes of forage for saline soils which Agriculture Service Boards could use.

Liaison and assistance were provided to the Lands Division on forages and grazing for sheep under pivot irrigation. Contact was

maintained with the Alberta Chapter of the Society for Range Management.

Publications worked on during the year:

1. Forage production on selected native prairie sites in southern Alberta. C.D.A. Technical Bulletin, 1985-3E, 46 pp.
2. Range, Its Nature and Use. Energy and Natural Resources Publ., 34 pp.
3. Forage meter for estimating hay and pasture yields.
4. Controlling brush in Alberta. Agdex 643-3, under weeds.
5. Agri-News Articles:
   a) Pastures at Risk.
   b) Bank Your Bets for Next Year's Pasture.

g) SPECIAL CROPS

In 1985, the Special Crops Section initiated and assisted in the promotion of many and varied programs for Alberta special crop growers. Market prices for special crops remained on the up side during the year and assisted in encouraging larger acreage plantings. Special crop producers are taking full advantage of the alternate source of income, valuable livestock feed and soil building capabilities of these crops. Field pea, lentil, fababean, dry bean, confection sunflower, grain corn, mustard, alfalfa seed and wild rice acreages increased in 1985.

An agronomic research program for three pulse species, located at four central Alberta sites, was initiated with Farming For The Future funding in 1985 to complement the growing interest in these crops in the central and north central areas. The results proved to be valuable, and further funding has been received for 1986.

Continued assistance and advice to producer organizations was provided. Assistance was extended to the Pulse Growers' Association of Alberta to expand within the province. Pulse growers in the

northern and central areas now have representation to the PGAA. The Alberta Wild Rice Growers' Association, and the Alberta Alfalfa Seed Producers Association continue to receive advisory expertise.

This Section continues to co-operate with and supply materials for local demonstration plots. The plots are valuable for tours and local farmer awareness.

h) CROP RESEARCH

For the second consecutive year, dry conditions predominated most of the early growing season while the harvest period was wet and cool. Consequently seed yield and seed quality was greatly reduced. One breeder field of Samson barley was completely lost and the seed of T44 triticale was badly sprouted.

The 1985 royalties on Empress and Abee were approximately $25,000. Seed sales on Samson were approximately $36,000.00 for 1985. Revenues for 1986 will be low since no new varieties are being released in 1986.

In the barley breeding programme emphasis continued to be placed on earlier maturity, disease resistance and straw strength in both 2-row and 6-row feed types. Efforts will be made to develop a new strong strawed semi-dwarf which is earlier than Samson and with superior overall disease resistance. Special emphasis is being given to 2-row semi-dwarfs which might better fit into a direct combining harvest system. The cultivar BT518 was presented for registration and was accepted. Entries into the 1986 co-op tests consist of two second year 6-row and one second year 2-row; three first year 6-row and two first year 2-row lines.

The high lysine program has yielded several lines which have relatively good yields and stable lysine content over a wide range of environments. Three lines had a biological value over 80 with values of 81.7, 82.3 and 84.2 with Casein as a check at 85.7. There was

a variation in line for Total Digestible Protein, Biological Value and Net Protein Utilization in Rat trials carried out by Dr. R. Beames at the University of British Columbia. This variation seems to have little to do with total protein content or percent lysine. It is our opinion that the protein digestibility is the major factor involved. This is being investigated further.

Seed quality and maturity in spring triticale continued to be strongly emphasized in 1985. The extremely poor harvesting conditions resulted in lower than normal seed viability in this species. However, it presented the selection pressure necessary for identifying lines with poor sprouting resistance. The high yielding seed and silage line, T44, was presented for registration and was accepted. One second year and two first year entries will be evaluated in the 1986 Western Spring Triticale Co-op trials. Five winter wheat and five winter triticales are being evaluated in the 1985-86 Canadian Winter Hardiness Trial at a national level. A further seven winter triticales are in the Winter Triticale B-Co-operative Trial during the 1985-86 season.

The need to maintain adequate seed stocks of licensed varieties has led to the acquisition of an additional 135 acres of land adjacent to the research farm.

The 1984-85 winter co-op tests were lost due to the extreme winter conditions. Most of the breeding material was replanted in the fall of 1985 together with new introductions. Emphasis is on the development of short statured types with improved winter hardiness and early maturity.

Protein quality and digestibility on the triticales seem to be equal to Samson barley in limited tests carried out by Dr. R. Beames. Further testing is now being carried out at U.B.C.

The Agronomy programme was also adversely affected by the weather. Emphasis continued to be placed on the management practices associated

with the spring and winter species. In addition, in view of the interest in Intensive Crop Management (ICM), preliminary studies into some of the components of ICM (seeding density, fertility) were initiated in 1985 and will be expanded in 1986. While all winter trials (1984-85) seeded on fallow were completely killed, a date of seeding x fungicide trial on stubble showed very little winter injury. Several tests to compare various methods of seeding (minimum till, zero till and ICM) were established in 1985.

Satisfactory progress was made with the Farming for the Future winter cereal project during its second year of funding. Emphasis in 1986-87, the final year, will be towards developing a rapid and inexpensive seedling screening method for cold hardiness potential. More so than in previous years, there was an increase in the time spent on field days and at farmer meetings. Key topics were intensive crop management and cereals for forage production.

Major emphasis for 1986 is being placed on Intensive Crop Management and Semi-dwarfs. We feel this is one answer to the cost squeeze farmers presently find themselves in.

ALBERTA TREE NURSERY AND HORTICULTURE CENTRE

The Alberta Tree Nursery and Horticulture Centre had an excellent year in 1985/86. Field and container stock performed well under somewhat adverse conditions. For the first time, we have several hundred thousand plants in surplus. Several production changes are being considered to reduce the surplus. Reducing the field time for some varieties is necessary.

The cutbacks in field and turf research were major program concerns; two permanent positions were lost to budget cutbacks. The turf trials were given a minor level of maintenance. As well, the field trials remaining were maintained with no new ones started.

The financial operations of the Centre have remained relatively constant for the 1985/86 budget year with only minor reductions.

The tissue culture centre has done some excellent work on saskatoons and black cherry. Mr. Kris Pruski has finished his masters project with only some loose ends to tidy up. This new venture with the University of Alberta has worked out very well. It is hoped that we can continue such co-operative ventures in the future.

The Greenhouse Specialist came on staff in February, 1985, completing the greenhouse task force recommendation that an extension specialist be placed in northern Alberta.

Trade and industry contacts were quite numerous by all Centre staff. The nursery visits were started and, I trust, were beneficial. Each of the production specialists had production tours in 1985 to the benefit of producers, wholesalers and consumers. The three "Production Notes" newsletters received favorable comments and seemed to provide the kind of information required.

A more detailed description of the activities of the A.T.N.& H.C. may be obtained by requesting the 1985 Alberta Tree Nursery and Horticulture Centre Annual Report from the Print Media Branch, Alberta Agriculture, 7000 - 113 Street, Edmonton, Alberta, T6H 5T6.

ALBERTA HORTICULTURAL RESEARCH CENTER

The Alberta Horticultural Research Center (AHRC) Brooks, was involved in province-wide extension and research activities relating to all areas of horticulture and irrigated specialty crops. Cooperative research projects are conducted in collaboration with personnel from Agriculture Canada, University of Alberta, other Plant Industry Division Branches and the Irrigation and Conservation Divisions of Alberta Agriculture.

A number of program and staff changes (see page 124 for staff changes), occurred at AHRC in the past year. The Regional Crops Laboratory and the Seed Potato Programs at Olds were transferred from the Crop Protection Branch to AHRC. Added emphasis was placed on post harvest technology with the appointment of a professional staff member in that area. A Farming for the Future program on annual and perennial forages operated at AHRC for seven years was completed.

AHRC provides research, development and extension services to specific horticultural and/or commodity sectors. The Environmental Horticulture Section carries responsibility for research and extension into production of small fruit, bush and native fruit, ornamentals and nursery crops and greenhouse vegetable and flower crops. The Vegetable and Special Crops Units provide applied research, demonstration and extension assistance for vegetables, potatoes, seed potatoes, corn, as well as a variety of new crops such as beans, forages, grain legumes and herbs and spices. In addition to providing technical support for the commodity based programs the efforts of the Laboratory Services Section are directed toward diagnosis of plant diseases, insect and weed control, crops storage, food processing and product development. Administrative and operational support for the above three program areas are provided by the Administrative Services Section and the Farm Operations Section, respectively.

Test sites for the research extension function of AHRC staff are located throughout the province. In addition to the utilization of the three farms at Brooks, research/demonstration plots are found in locations such as Bow Island, Edmonton, Standard and the Peace region.

The extension activities of AHRC personnel support and complement extension services provided by the other Alberta Agriculture staff centered in regional and district offices. Contact with both commercial and amateur horticulture clients is assured by maintaining a close working relationship with the industry, input into advisory committee recommendations, and involvement with grower groups and associations. Staff regularly conduct, teach and participate in numerous short courses and seminars held throughout the province. To ensure rapid exchange of information between the provider and the researcher, staff host commodity oriented field days at AHRC and participate in similar field days held elsewhere. Membership and active involvement in commodity advisory groups, Agriculture Canada expert committees, and industry-based committees permit the dissemination of applied research information to all sectors of the horticulture industry.

ACTIVITIES

a) Vegetable Program

The vegetable program conducted cultivar evaluations of two processing vegetable crops and three fresh vegetable crops. Cultural studies were conducted to evaluate the effort of plant populations on yield and maturity of several vegetables. A cooperative study with the University of Alberta, evaluated the effects of several mulch types on tomato yields.

b) Market Garden Programs

The effects of mulches and tunnels on earliness and total yield of vine crops and sweet corn continued to be evaluated. A new product 'Re-May' was also tested. This program carries responsibility for cultivar testing of a number of vegetable crops, including cooperative testing of asparagus from the national breeding program and an evaluation of rhubarb.

c) Potato Program

The potato program is extensively involved in seeding and cultivar evaluation as part of the Prairie Regional Trial System and the Prairie Breeding Program. Special efforts were made to introduce new cultivars to the commercial industry in a more direct manner. The program cooperated with the Irrigation and Conservation Division on a water use nutrition project. A number of cultural or production trials were also conducted.

d) Seed Potato Program

The seed potato program provided 51,000 pre-elite tubers of 22 cultivars to Alberta seed potato growers. Several techniques to improve tissue culture production and disease detection were introduced into the program. An aphid monitoring project was initiated in seed potato fields.

e) Special Crops Program

Cultivar evaluation and improvement of production practices for a number of special or alternate crops are the main emphasis of this program. Cooperative projects were conducted with the Soils Branch, Field Crops branch and the Alberta hail and Crop Insurance Corporation. The annual forage project funded by Farming for the Future was completed.

f) Fruit Crops Program

Emphasis was placed on the development of production practices of saskatoons, strawberries and raspberries. The Prairie Cooperative Fruit Breeding program was formally terminated with the recommendation that two seedlings PF 36 and PF 50 be released as named varieties. The Agriculture Canada station at Morden, Manitoba will officially release the varieties.

g) Ornamentals Program

The propagation of ornamentals received additional attention. A trial to evaluate the effect of timing on when to take cuttings, revealed that an early morning hour is preferable. Hardiness testing of new ornamentals continued to be a major part of this program, although only a few new introductions have been received in recent years.

h) Greenhouse Program

The emphasis in the greenhouse program is gradually shifting more to cut flower production, although studies also continued on various greenhouse vegetables. A need for stricter environmental control within the research greenhouses has been identified.

i) Plant Pathology Program

A project to monitor the survival of Verticillium Wilt of alfalfa in the dehydration process was completed. Experiments to control root rot of pulses by soil loosening was continued. Support was provided to the bacterial ring rot testing process.

j) Post Harvest Physiology Program

The incumbent in this program also assumed some of the plant pathology program duties by working on projects such as potato, turf and ornamental diseases. A storage trial on ornamentals was completed. A fungicide evaluation trial on cabbage was continued. Mushroom production enquiries are also handled by the incumbent. A number of requests were answered.

k) Entomology Program

Monitoring for Dutch Elm Disease was conducted at various border points in southern Alberta. Several loads of firewood were inspected; no vectors were found. The southern Alberta grasshopper survey was assisted. The European Corn Borer survey and control research was continued.

l) Weed Control Program

Trials for weed control, where new herbicides or candidate herbicides are evaluated, were conducted in most crop areas for which the center maintains responsibility. A trial to evaluate herbigation of various herbicides on potatoes was initiated. Several on-farm demonstrations, particularly at commercial nurseries, were well received. Work with weed control of saskatoons was continued in the Peace River area.

m) Regional Crops Laboratory Program

In excess of 1800 specimens were received in the laboratory at Brooks, and approximately 700 at the laboratory in Olds. The number of samples received from commercial horticulture and special crops producers continued to increase.

n) Food Processing and Quality Evaluation Program

The processing of saskatoons, with an effort to improve saskatoon product quality, continued, as did the quality evaluation of cultivars of fruits, vegetables and potatoes.

Assistance was provided to commercial processors both in regard to quality control and equipment development.

A more comprehensive description of AHRC research and extension activities may be obtained by requesting the 1985 Alberta Horticultural Research Center Annual Report. Details concerning cultivar evaluation trials on various crops are available in the AHRC Pamphlet series. These are available from the Librarian, AHRC, Bag Service 200, Brooks, Alberta T0J 0J0.

REGION ONE - LETHBRIDGE

Blair Shaw - Regional Crop Production Specialist

The unfortunate combination of very low spring and summer rainfall, with higher than normal precipitation during harvest, resulted in the lowest cereal yields and grades of the decade. This was complicated by the widespread spring infestations of grasshoppers (the worst since the 1930's), and a major outbreak of pale western cutworms in the west and southwest of the region (Magrath, Fort Macleod and Claresholm) as well as scattered heavy infestations in the middle of the region.

The winter kill loss of winter wheat in the eastern and central part of Region I was serious enough to require re-seeding of nearly one third of the acreage (most severe damage occurred on summer fallow where there was insufficient snow cover during an unseasonably cold period in the early spring).

For the first time in many years, established alfalfa stands were severely weakened (giving a very poor first cut) or even killed outright by the severe spring conditions. This affected about 25% of the alfalfa acreage and was more severe in the eastern part of the region.

The dry spring and summer meant very low yields of grasses for seed and forage with virtually no seed production and hay and pasture yields under a quarter of a ton per acre.

The irrigated alfalfa hay (which wasn't winter damaged) produced very well and commanded a fine price. Even straw was in the top end of it's price range because of the many crop failures on dryland. The hay shortage was alleviated partially by the increasing use of grain in rations, and by importing hay from outside the region.

The importation of hay caused several potential problems of concern to agriculture in the region. The most obvious and important problem was the potential for introduction of weedy species such as scentless chamomile from the north, and knapweed, dyers woad, and yellow star thistle from the south and west. There has been a continuation of the reporting and inspection process to prevent the spread of these weeds. These inspections also served as a monitor of any possible introduction of diseases and pests.

Some potato and carrot crops were frozen in the fields and were lost. There were no sugar beets planted in 1985. The thirty thousand acres which were not planted to beets went mainly to soft wheat and feed barley and 10-15% of this acreage went to alternative crops. Irrigated cereal grains produced outstanding yields in 1985 but a prolonged wet spell at harvest resulted in a high percentage of feed grade wheats and low returns per acre.

Special crops generally produced well, with dry beans yielding at their highest levels ever. Alternative crop prices were well above the break-even level in 1985. Grain corn was the major exception with the early, wet fall and delayed maturity resulting in wet, low bushel weight corn of poor quality which demanded a low price.

The low rainfall in the spring and summer caused a short term reduction in the visible effects of salinity because the recharge rate dropped. However, this same low precipitation caused numerous unsatisfactory stands of seedling interceptor crops such as alfalfa.

The late summer and early fall rains filled dugouts and watering holes on the pasture and range areas and there were sufficient moisture reserves to give good spring pasture. Winter wheat and fall rye went into the winter of 1985 in above average conditions in areas where there were no grasshoppers.

REGION TWO - AIRDRIE

Larry Welsh - Regional Crop Production Specialist

1985 proved again to be an extremely frustrating and adverse year for crop production. While yearly precipitation was not down substantially, it was however very poorly timed. Growing season moisture was extremely reduced (about 45% of normal) in the months of May, June and the first half of July. By then the damage was done. Resulting yields were severely depressed. Late July, August and September rainfall was much higher than normal. This brought on a severe second growth of cereal crops resulting in one of the dirtiest, difficult harvests ever. Heavy autumn rainfall caused a long harvest. Many crops lay in swaths for as long as 6 weeks. Sprouting was common and considerable grain was harvested tough and damp. Aerating and grain drying was a commonly used practice. All crops in the region however were harvested.

While hay crops were severely depressed because of the growing season drought, winter feed supplies were adequately bolstered by the large amounts of second growth cereals harvested in the fall. Some producers got two silage crops off the same field! Baling straw was also commonplace.

Like 1984, pastures were again subjected to heavy grazing pressure because of the spring and summer drought. Extremely good pasture management including a wise use of annual forage crops will be required to bring pastures back to a normal condition.

A severe grasshopper and cutworm infestation resulted in severe damage throughout most of the region. Some producers sprayed the same area as many as 4 times.

While fall soil moisture was excellent, winter wheat seeding was much reduced. Producers were too busy trying to harvest and memories of the severe winter kill of 1984-85 was still foremost in their minds. As it turned out the winter of 1985-86 was one of the mildest winters on record. Very little (if any) winter kill was experienced on all fall seeded crops. Shrubs, trees and ornamentals in general had a remarkably good winter survival.

Production extension courses were somewhat reduced in 1985-86 as district offices were under heavy pressure administering the many assistance programs for farmers.

Soil conservation was widely stressed once again. With reduced growth and lack of crop residue on fields, wind erosion was a constant threat. Wind erosion on March 27th caused extreme damage.

A close association was enjoyed with the region's 12 Co-op Seed Cleaning Plants. Cleaning volume was down during the winter of 1985-86. Depressed grain prices and poor germination of 1985 harvested crops had farmers in a quandary as to what crop to grow in 1986. The Carstairs Seed Plant sat in a partially built stage for the 3rd consecutive summer because of problems finding a suitable building contractor to complete construction after the initial builders contract was terminated.

The Calgary Seed Fair and Hay Show held in early March also had a reduced number of entries because of the general poor quality seed across Alberta.

Agricultural Service Board programs have adopted a "maintenance only" attitude since their budgets have been frozen. While keeping their normal service programs functioning there was little room to expand soil conservation and other much needed programs.

The Foothills Forage Association decided to become active again with a substantial increase in forage program activities planned for 1986.

As we enter the new crop year the excellent soil moisture in the west half of the region gives some optimism that crops will be much better in 1986.

REGION III - RED DEER

Wayne Jackson - Regional Crop Production Specialist

Although soil moisture at the beginning of the year was favorable for good crops in 1985, it didn't turn out that way in the end. Rainfall was almost non-existant until mid July and crops in nearly all of Region III suffered. When rainfall came, it was too late to salvage good yields. Most of our rainfall came in September and October and what little harvesting was done was prolonged until late in the fall with most of the grain harvested tough or damp. A few producers could not finish combining before snow fell.

Field Crops

A lack of snow cover combined with cold soil temperatures took their toll on forage and cereal crops. Winter kill in alfalfa was severe and over three quarters of all the fall rye and winter wheat seeded in 1984 was plowed up.

Cool temperatures and late spring frosts kept soil temperatures low so germination was poor and grass growth was very slow. Because many pastures had been over-grazed in 1984, grazing was very short in 1985 and many producers were forced to turn cows into cereal crops by mid-summer. Hay yields were only one half of normal and were insufficient for winter needs.

Most crop stands suffered from the dry spring conditions - especially barley. When the moisture came many fields had considerable regrowth so several producers cut them for feed or silage. With the shortage of hay, prices ranged from $75.00 to $110.00 per ton for good quality feed and those with feed to sell netted more from the feed than they would have from any crop they would have harvested. A large amount of feed was shipped out of the region to southern Alberta.

Acreages of the different crops didn't change much from the previous year. Canola was grown extensively and there was a big increase in the amount of unlicensed semi-dwarf wheat varieties grown.

Seed cleaning plants had another good year. Total value for the region approached 4.6 million bushels.

Soils & Soil Conservation

Wind erosion in spring still remains a concern. The problem was reduced in 1985 as less fall work was done the previous year due to early snow cover. However, little stubble and trash remained from this year's poor crop so erosion potential for 1986 is high.

Interest in sub-surface ripping is increasing. This feeling is the sub-surface clay layers are becoming compacted and ripping is required to get improved root penetration and water movement.

Patches of foxtail barley are showing up in many pastures. Generally this indicates a saline situation. Another soil problem type that needs attention.

There was heavy demand for fertilizer this spring as little was applied in 1984. Many dealers had trouble keeping up to the demand for anhydrous and/or anhydrous equipment.

Horticulture

Interest remains high for information on vegetable production, landscaping and shelterbelt establishment. Tree orders were plentiful and good quality material was received from the tree nursery.

One part-time employee worked in the city of Red Deer handling local horticulture calls.

The number of hobby gardeners continues to rise and support at the farmer's markets is good.

Pest Control

Agricultural pests did more damage than any year for quite some time. Because of the dry spring, grasshopper infestations were severe and spraying was done south of Veteran and west of Wetaskiwin.

In August, the east half of the region had a bad diamond back moth infestation in canola and over 60,000 acres were sprayed to control this pest. At times the demand for aircraft was greater than the service available.

The usual horticultural pests were present but the levels of forest tent caterpillars and spruce budworm were down.

Weed Control

Annual weed infestations were not as bad as previous years but the perennial weeds provided strong competition in the dry conditions and continue to increase. Scentless chamomile infestations spread and several agricultural service boards implemented extension programs aimed at preventing the weed from getting out of hand. The large movement of forage is one of the main causes of spread of this weed.

Black nite shade was identified in the region.

Green smartweed was a severe problem in many canola crops. A small application of Banvel to stunt the smartweed is a practice that is becoming more and more common.

Extension

Demand for short courses was very high. New varieties, herbicides, and fertilizers use and efficiency were popular topics. Many were small group discussions where producers could ask specific questions and get information to adapt to their farm.

REGION IV - VERMILION

Ellis Treffry - Regional Crop Production Specialist

The following is a short summary of some of the major trends and concerns in the Plant Industry sector during 1985 in Region IV.

Soils and Soil Conservation

An interest in deep ripping was addressed in Region IV with several demonstrations. The variation in crop growth because of pipe lines caused the initial interest. Hopefully some of the questions will be answered in the next year or so.

Farmers continue to work at field consolidation by filling up potholes, eliminating bush patches, draining or consolidating sloughs, etc. This in turn is giving larger open fields which are more prone to wind and water erosion. Soil and moisture management as a combined effort is becoming an important consideration.

Farmers are trying to tailor their fertilizer usage much more closely to soil test recommendations, precipitation averages and soil moisture. The accuracy of the support information and its availability is important. In particular the accuracy of the soil test results and recommendations must be high and consistent.

Field Crops

Excellent growing conditions prevailed early in the growing season. However, drought conditions during mid season followed by a difficult harvest meant a crop of lower yield and quality. Harvesting across the northern half of the region was not totally completed. Most northern areas had from 10 - 30% of the crop left in the field. Fall frosts combined with poor harvest conditions affected the germination of cereal and oilseeds in many districts.

A growing interest exists in tame pastures both perennial and annual. Several projects were initiated under the "Farming For The Future" program. The use of tame pastures of all kinds should be encouraged because of the overgrazed state of native pastures. Summer drought conditions continues to adversely affect native pasture condition.

Cereal and oilseed variety plots at Smoky Lake, Viking, Vegreville, Lac La Biche, St. Paul were initiated in cooperation with Canada Agriculture Vegreville by the Field Crops Branch. These are in addition to previous plots at Vermilion and Provost. The information being obtained is well reviewed by producers and extension staff.

Late season interest in alternate crops was evident. Because of a good price in 1985 lentils promise to be in demand in 1986 as a cropping alternative.

The Vermilion Seed Plant Cooperative began construction of a new facility in 1985. It is expected to be in operation in the early spring of 1986 replacing a plant built in 1953. The upgrading program continues to be a well used and important program, one which has helped improve the capability and quality of seed cleaning in Alberta.

Horticulture

Extension meeting held to discuss horticulture topics continued to be well attended. This is especially true in the area of farmstead planning and beautification. The demand for this type of information indicates need and desire.

Market garden production is centered around the larger urban centers. The farmers markets are present in most communities, however, they are dependent entirely on the urban population base for success.

A growing percentage of the native aspen poplars in the region are reaching maturity and are dying because of age or because of a weakened condition caused by repeated defoliation by the forest tent caterpillar. The disappearance of these trees combined with fence to fence clearing or tree cleanup is causing concern because of evaporation loss, windy conditions and erosion losses because of wind and water. Field shelterbelts unfortunately have not become a popular alternative.

Weeds, Plant Pests & Insects

The spread of scentless chamomile along the edges of highways and secondary roads was very noticeable. The edge of the road does not retain herbicide residues so a new approach is needed to control this situation. Other species of concern are toadflax, leafy spurge, tansy, corn spurry, Canada thistle, cleavers and annuals such as wild oats and green foxtail.

The number of herbicides and the situation of the same active ingredient being marketed under several trade names is causing some confusion among producers. The specific nature of many herbicides is making application techniques more precise and the chance of misapplication and consequently crop damage greater each year.

Fortunately the weed control area is one where much information is available and the working relationship between the trade and the farming public is high. This does help address the previous comments.

The grasshopper situation in Region IV was less than anticipated. Later in the season the Diamond Back Moth was present in Canola with limited acreage sprayed.

The main disease concern continues to be Virulant Blackleg in Canola which is becoming more prevalent adjacent to the Alta-Sask border. Sclerotina was not too severe in 1985 but promises to flare up readily when the proper conditions are present.

REGION V - BARRHEAD

Bill Chapman - Regional Crop Production Specialist

The 1985 growing season was plagued by weather problems. An early spring, then wet snow, allowed farmers very little time to complete both fall and spring operations. This increased spring activity, put added demands on fertilizer dealers and equipment. As a result, dealers were put on consignment which caused 2-3 day shortages of anhydrous ammonia and ammonium nitrate in early May. Spring rains which usually delay seeding a few days, arrived late causing a short season for post emergent herbicides. This change had farmers more concerned with moisture as excessive spring tillage dried out seed bed causing uneven germination.

Hot dry weather in July and scattered showers caused drought stress on most crops. Total precipitation during the growing season ranged from 2" to 18". Areas receiving minimal or slightly more rainfall were the Clyde, West of Athabasca, New Sarepta, Redwater and Drayton Valley. The added stress promoted maturity but cool cloudy weather in August delayed development and caused harvesting problems. Swathing started in late August but was delayed up to 7 weeks through September into October. In total 92% of the crop was harvested in 1985, with the remainder combined in spring. The main areas affected were Thorhild-Athabasca-Boyle districts with other fields scattered throughout the region. Rather than wait, farmers did fall field work when they were unable to combine. This was the opposite of 1984 when it was too wet to even travel on the fields.

The tough grain harvested ranged from 16-22% moisture with farmers drying feed barley down to 14.6% for export and 16% for livestock consumption. Drying grain added $.25-$.30 per bushel to production costs but also increased acres harvested as those without grain dryers were delayed. Aeration only proved successful in cooling grain as relative humidity was too high to lower the moisture content.

The poor harvest weather deteriorated crop quality as some swaths were in the fields from 5 - 7 weeks. Those crops left standing had lower losses due to sprouting and excessive moisture. Grades dropped to feed rather than 3 C.W. H.R.S. for wheat, Canada #2 for canola, feed for barley. Germination percentages range from 65 to 90% with average in 80-85% range. Pedigreed growers, as well as those farmers selling 'grown from seed', had substandard germination levels.

Total yields in the Region were up in most districts and 70% of normal in Athabasca - Drayton Valley - New Sarepta, and Clyde areas.

Crop Yields

		Wheat	Barley	Oats	Canola
Census District	11	44 (39)	61 (52)	73 (66)	24 (22
	13	37 (35)	54 (49)	66 (65)	24 (23)

(1984 yields)

The only positive aspect is the fluctuating demand for grain and your ability to weather the down turn in prices.

The best alternative is reversing marketing intentions. Approximately 60% is sold through the elevator system and 40% is consumed within the region. Some producers have altered this to consume 60% and/or sell it to local livestock producers and only market 40% of their production to elevator system for export. This adds flexibility to marketing as low quotas have restricted cash flow in 1985.

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Fertilizer Use

A total of 707,772 tonnes of fertilizer was applied, value was approximately 28 million dollars for 11% of provincial total. A higher portion of product used is blended and more closely balanced to meet crop requirements. The trend to either band the fertilizer or increase placement with seed is more common.

These same farmers are also mounting granular herbicide applicators on their banding equipment to reduce field operations.

More producers in the Linaria - Westlock areas used either copper sulphate or liquid chelated copper on cereals planted on peat soils. The fine tuning of this program is underway as economic responses were noted. The other new change is application of sulphur on barley as well as canola as the high level of continuous cropping has depleted soil reserves.

Disease Problems

The new cereal varieties were contaminated with loose smut. Seed treatment rates were inadequate but have increased by 25% recently. Root rot appeared to be at near normal infestations. Sclerotinia problems were lower as the dry weather in July restricted spore development in crop canopy. Approximately 3500 acres of Westar were aerial sprayed with fungicide as yields were set at 45-50 bushel potential. The virulent forms of black leg were discovered at additional sites within the region. It was most common on canola seeded on canola stubble as more farmers are changing rotations due to net returns.

Leaf disease levels in barley were noticed but at very low levels as a result of dry weather.

Extension

The extension program was reduced to 85% of previous years levels. In total 26 Extension Meetings and 7 tours were crop production related. One major change is the advent of crop production groups such as the North West Peat Soils Group, Pro Grow Canola Club at Fort Saskatchewan and the Pembina Crop Club. These producer based groups are sharing and utilizing the most effective management techniques as well as running demonstration plots and tours. The staff continued to work with commodity groups such as Alberta Barley Growers and Alberta Canola Growers on production related farmer meetings.

Agricultural Service Boards

The Ag. Service Boards conducted a wide variety of programs in cooperation with the District staff. Budgets were still frozen however some Boards have increased their S.C.A.P. and F.D.R.P. spending. The other programs included crop variety plots, forage demonstrations, weed control and predator control. One new change was the formation of a Soil Conservation Committee comprised of 3 chairman, and 3 Ag. Fieldmen along with Department Staff from the region. The main roles of the committee are to coordinate regional activities and draft a long term soil conservation strategy for the region.

Seed Cleaning Plants cleaned a total of 3,707,766 bushels of grain. The three plants at Barrhead, Morinville and Radway were in order behind Camrose for highest total volume cleaned for the province. Construction and upgrading on the plants were Leduc $181,134 relocate and upgrade; Stony Plain $1,327,000-new plant and an additional $305,020 in upgrading equipment for 4 other plants. Total grants of these projects amounted to $589,221 for the six plants in the region.

Remarks

The 1985/86 crop year was affected by drought but was devastated by falling prices. The world oversupply and change in U.S. Farm Bill has drastically affected present and future farm income. Comparing '85 to '86 return over cash costs have dropped to 52% for wheat, 65% for Canola and 9% for barley based on new grain prices. To add to the problem non-board prices for grain dropped prior to seeding the '86 reflecting this change. Producers with low equity are under severe financial pressure, and others are gradually spending equity to maintain production levels.

General Overview - Forages and Special Crops

Ken Lopetinsky - Regional Specialist

The 1985 growing season was one of the most variable ever seen. It can be characterized by the following:

a) In early spring winter injury to forage crops and fall seeded fall rye extended throughout the region, although the southern and western parts were hardest hit with approximately 20 percent of total acreage severally affected, most of which was plowed under in 1985.

b) Spring, summer, and fall moisture varied tremendously, even within districts. Some areas approached normal rainfall of up to 12 inches while some areas received less than 3 inches for the growing season. These drought areas were surveyed and recommendations sent to headquarters.

c) The harvest period for second cut forage, forage seed fields, and special crops was one of the longest on record, starting in August and finally ending in early November. The resulting wet harvest reduced fababean, field pea, and forage seed quality which reduced farmer income. Second cut hay yields were below normal due to hot dry July weather, and quality in some cases was also below average.

Specific Observations:

A. Both the Pembina and West Central Forage Associations continued to maintain a high producer interest in all activities. Both associations hired new managers and 1985 was the first full year for both with excellent results. The Pembina Forage Association developed a cow-calf pasture system on a half-section in the Fawcett area. Grazing may begin in 1986. Both associations had excellent results with their respective steer pastures and producer involvements showed the present keen interest in better pasture management.

B. The Northern Branch of the Pulse Growers Association of Alberta conducted seven field projects with the help of two On-Farm-Demonstration projects. Results were encouraging for special crops, especially field peas. Acreage increase in field peas but a decrease in fababeans was seen in 1985.

C. Interest in forages and especially intensive pasture management remained high in 1985 with numerous out-of-province requests. Six presentations were made in the Prince George, Vanderhoff, and Houston, B.C. areas as well as five days spent in the Salmon Arm area with the North Okanagon Dairy Association.

D. The completion of a three year intensive pasture survey showed average grazing capacities of over 3 A.U.M./acre with a high of 7.0 A.U.M./acre reported in one instance.

E. 1985 was a very active year in forages and special crops with a total of seven On-Farm-Demonstrations in this subject area and a total of 33 extension meetings during the year including 7 out of province activities. Work included participation in forages proposal for E.R.D.A. as well as three from out of province tours to various local pasture projects. Also participated in Advisory Committee functions for pulse crops, special crops, annual forages, and perennial forages.

F. Hay listings were again conducted throughout the region. Final listing in February showed 478 lots totalling over 45,000 tons of available forage for sale. This amount was similar to 1984-85 and some carry-over is again expected this year. Hay prices have dropped from last August-September high levels.

Producer Concern:

A concern of anticipated low 1986 barley prices is resulting in a tremendous increase in producer inquiries in the various special crops. It is anticipated that there will be increases in special crops acreage this spring.

REGION VI - FAIRVIEW

Mike Rudakewich - Regional Crop Production Specialist

Adversity teaches valuable lessons and there were several lessons from the 1985 season. Though the drought in 1985 was widespread throughout the region and the driest in some districts since 1928, there were many positives.

1. Canola fared well on clover plowdowns with some yields up to 40 bushels/acre.

2. Cereals also performed well on clover plowdown even if the plowdown was in 1984.

3. Positive responses from fertilizers occurred generally in spite of the drought.

4. Bromegrass seed yields were better by 100 lbs per acre than in 1984 with high rainfall.

5. Much fewer complaints about herbicide performance than usual for a dry year.

6. Early harvest even with moisture levels just over 20% brought in some of the best quality grain for seed.

7. Feed supplies miraculously turned out to be adequate.

Most farmers otherwise were reasonably happy with the yields had the harvest progressed normally. It did not, however, and most grain was harvested between rains and snow and almost none threshed dry. About 30-35% of the grain remained unharvested when winter set in with about equal proportions of wheat, barley and canola and lesser amounts of oats and forage seeds.

A carry over of the adversity from 1985 into 1986 was the highest amount of unthreshed grain, and the least amount of fall work done. The overwintered grain deteriorated substantially from prolonged wet conditions.

Extension Activities

The winter extension activities were strongly based on poor economic conditions in agriculture and drought stricken crops. Attendance at all meetings was very good.

1. Quality Seed Production

Because it was recognized that supplies of good seed could be short a program was initiated by December through extension offices advising farmers to take extra care in selecting seed lots and for those with good grain for seed to withhold sale to elevators. Seven meetings were conducted throughout the region on producing and handling grain for top quality seed.

2. Wheat Production Survey

Most of the survey results were completed by March. Portions of the survey results were used in conjunction with varietal meetings. There was a slight flurry with unlicensed wheat varieties that even at this point isn't adequately resolved.

3. Canola production

Meetings were held in three locations some with joint participation of "Grow with Canola" and some without.

4. Forage Seed Production

Several meetings were held with the help of the Marketing Branch and C.D.A. Beaverlodge. Strong interest and high turnouts were recorded at most.

5. Perennial Weed Control

Twelve information meetings were conducted on Canada thistle and perennial sow thistle control. The excellent turnouts and interest is attributed to both the need for information and general desire to control infestations to minimal levels.

6. Conservation

Three seminars were conducted specifically on conservation and handling of crop residues. Conservation otherwise underlies all information presented and is done in as practical a fashion as possible. It becomes more palatable and acceptable in this fashion.

Seed Cleaning Plants

In spite of early concerns that stocks of seed might be quite short, no serious problems with volumes were reported and these are therefore assumed to be adequate to at least break even. Seed plant inspections are being taken with increased interest by board members and we will therefore continue to organize inspections on this increasing interest level.

Research and Demonstrations

Demonstration plots are an excellent means by which the spoken word can be combined with visual results. Our single greatest challenge in this respect is to plan demonstrations with a meaningful objective and to have suitable equipment with which to do a good job.

Several A.S.B.s are continuing with considerable emphasis on demonstrations and improvement in their quality.

Projects:

1. Perennial Weed Control at Eaglesham. This project is now into its third year as of 1986. We had in the past excellent but inconsistent control of thistles utilizing low cost herbicides and light tillage. In 1985 we had excellent control utilizing deep tillage. We have yet to determine the consistency of each and what factors are involved in the consistency.

2. Seed Quality Trials. Projects were initiated with C.D.A. to evaluate fertility factors in improvement of seed quality.

Overall, agriculture is taking on more sophistication and complication as a consequence of research and technology. Producers are only too willing to add any dimension to their farm that represents improvement with some degree of profit. The challenge remains with us to bring this newness into our areas of influence in a practical fashion.

INVENTORY OF PLANT INDUSTRY RESEARCH PROJECT - 1985

Projects	PMY	TMY
Cereals and Oilseeds	3.80	28.50
Forage Crops	1.75	1.25
Special Crops	2.35	3.85
Ornamentals, Trees and Shelterbelts	1.33	3.16
Fruit Crops	0.90	1.24
Vegetables and Potatoes	2.63	5.42
Food Processing	0.18	0.60
Greenhouse Crops	0.70	1.00
Soil Management - Fertilizers - Analysis	1.80	4.70
Weed Control	2.45	3.40
Apiculture/Entomology	0.70	0.80
TOTALS	18.59	53.92

CEREALS AND OILSEEDS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Feed Barley Breeding - to develop high yielding adapted varieties of feed grains with emphasis on protein contentand quality.	1 site Irrigation 1 site Area 1 1 site Area 2 1 site Area 3 4 sites Area 4 2 sites Area 5 1 site Saskatchewan	J. Helm D. Salmon F. Mederick	Field Crops ARC	On going. Reported Field Crops.	1.25	11.25
Spring Triticale Breeding	1 site Irrigation 1 site Area 2 2 sites Area 3 3 sites Area 4 2 sites Saskatchewan	D. Salmon J. Helm F. Mederick	Field Crops	Ongoing.	0.40	2.45
Cereal & Oilseed Regional Variety Trials on barley, wheat, oats, flax and rapeseed	4 sites Area 1 3 sites Area 2 4 sites Area 3 6 sites Area 4 7 sites Area 5 5 sites Area 6 4 sites Irrigation	J. Helm D. Salmon B. Wolfe Z. Kondra D. McAndrew S. Kibite R. Gaudiel K. May	Field Crops Field Crops Ag Canada U of A Ag Canada Lacombe AHRC Ag Canada	Ongoing. Reported Cereal and Oilseed Advisory Committee, Field Crops and Agricultural Research Council.	0.30	8.00
Winter wheat and winter triticale breeding and agronomy	Brooks, Lacombe Lethbridge Olds, Trochu 3 sites Saskatchewan	J. Helm D. Salmon F. Mederick	Field Crops	Ongoing. Reported Field Crops and Alberta Research Council.	1.00	2.20
Feed Grain Agronomy - silage production, crop rotation study and disease evaluation	Lacombe Olds	F. Mederick J. Helm D. Salmon	Field Crops	Ongoing.	0.20	3.20
Winter wheat cold hardiness study	Lacombe Edmonton	F. Mederick J. Helm D. Salmon	FFF	Initiated 1983-84. Renewed 1984-85. Renewed 1985-1986.		

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Intensive Crop Management in Barley	Lacombe	F. Mederick J. Helm S. Mahli	Field Crops Field Crops	Initiated 1985		
ICM Studies in Irrigated Soft Wheat	Bow Island	B. Roth D. Major	Field Services Ag Canada	Initiated in 1985. Reported initial observations to ASWGA Potash & Phosphate Institute, farm seminars.	0.10	0.30
Screening seed treatment fungicides for efficacy against stem smut of fall rye and bunt of winter wheat	Lethbridge Brooks	B. Puchalski R. Howard	Ag Canada AHRC	Active. AHRC Annual Report 1985. ECPUA Pesticide Research Report 1985.	0.10	0.20
Insecticide foliar sprays for thrips in barley	Fairview	R. Butts	Reg Crops Lab, Fairview Report 1985.	Complete. Will be reported in ECPUA	0.10	0.10
Confinement trials for Lygus sp. in Canola	Fairview	R. Butts	Reg Crops Lab, Fairview	Transfered to Alberta Environmental Centre, Vegreville.	0.05	0.50
Control of leaf disease in barley with fungicide	4 sites in Westlock area	R. Carlyon B. Bjorge I. Evans L. Piening	Extension Crop Protection Crop Protection Ag Canada	Completed.	0.10	0.05
Improved disease forecast system for sclerotinia white mold in canola	Camrose/Barrhead	I. Evans P. Thomas M. Dolinski I. Parsons E. Zwanbag P. Kharbanda	Crop Protection Field Crops Field Crops Dupont May and Baker AEC, Vegreville	Completed.	0.20	0.25

FORAGE CROPS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Annual forage crops for southern Alberta	Brooks	G. Riemer R. Gaudiel	FFF AHRC	Complete. AHRC Annual Report 1985. AHRC Pamphlet 84-6.	1.05	0.40
Verticillium wilt of alfalfa	Brooks Lethbridge Southern Alberta	R. Howard H. Huang	AHRC Ag Canada	Disease surveys and active trials. AHRC Annual Report 1985. Plant Pathology Society of Alberta. Scientific Journals.	0.60	0.75
Silvertop in meadow foxtail assessment and control	Barrhead	R. Butts K. Lopetinsky	Reg Crops Lab Field Services	Inactive.	0.10	0.10

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Agronomic Studies on Corn - Dryland Corn Study - Varietal Trials, ICM Corn, Population Study	Bow Island Burdett Lethbridge	Blair Roth Dave Major	Field Services Ag Canada	Dryland Corn Study completed in 1984. Ongoing. Reported ACC, Corn Binder and SCAC.	0.15	0.30
Agronomic Studies on Sunflower - Varieties - Weed Control, Insect Control, Disease Control	Bow Island	Blair Roth H. Huang R. Gaudiel	Field Services Ag Canada AHRC	Year 5. Reported to SCAC, Sunflower School, and Alberta Sunflower Seeds.	0.15	0.30
Effects of Canopy Structure and Population on Sclerotinia Head Rot of Sunflowers	Bow Island	Blair Roth H. Huang R. Gaudiel	Field Services Ag Canada AHRC	Completed in 1985. Reported in SCAC, Sunflower School.		
Proper Inoculation of Pulse Crops	Bow Island Enchant Vauxhall Taber	Blair Roth R. Rennie	Field Services Ag Canada Pulse Growers Assoc of Alta	Completed in 1985. Reported to SCAC, PGAA. Seminars, Nukrop News, and various farm seminars plus the popular press.	0.15	0.30
Safflower Viability Study	Warner, Wrentham, Carmangay, Oyen, Nobleford	Blair Roth H.H. Muendel	Field Services Ag Canada	Year 3. Reported to SCAC Dryland Salinity Seminar. Safflower Tour.	0.15	0.20
Field bean cultivar and cultural trials	Brooks Bow Island	R. Gaudiel	AHRC	Active. AHRC Annual Report 1985. Alberta Pulse Committee 1985. Expert Committee, Bean Seminars 1985.	0.20	0.35
New crop cultivar, cultural, and adaptation trials	Brooks Bow Island Acadia Valley	R. Gaudiel	AHRC	Active. AHRC Annual Report 1985. Special Crops Committee 1985. Pulse Crops Committee 1985. Expert Committee 1985. Growers Meetings 1985.	0.40	0.60

SPECIAL CROPS (contined)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Herbs and spices cultural and adaptability	Brooks	R. Gaudiel	AHRC	Active. AHRC Annual Report 1985.	0.05	0.05
Corn and sorghum cultivar and cultural	Brooks Bow Island	R. Gaudiel	AHRC	Active. AHRC Annual Report 1985. Alberta Corn Committee 1985.	0.20	0.10
Screening fungicides for efficacy against sclerotinia white mold on dry peas	Brooks	R. Howard	AHRC	Active. AHRC Annual Report 1985. Alberta Pulse Crop Adv. Comm. ECPUA Pesticide Research Report 1985.	0.05	0.05
Effect of soil loosening on root rot and yields of pulse crops	Brooks Various locations in southern Alberta	R. Howard R. Gaudiel R.C. McKenzie	AHRC AHRC Irrig & Consv	Active. AHRC Annual Report 1984. Alberta Pulse Crop Adv. Comm. AHRC Pamphlet 85-10.	0.10	0.10
Special Crops Agronomic Studies for Central and North Central Alberta	Lacombe, Camrose, Vermilion, Morinville	F. Medrick R. Park	Field Crops Field Crops	Active. FFF Special Crops	0.75	1.50

ORNAMENTALS, TREES AND SHELTERBELTS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Woody Ornamentals	Brooks	B. Casement	AHRC WCSH PFRA Nurseries Ag Canada Morden	Active. Report to WCSH. AHRC Annual Report 1985. AHRC Summary Report 86-3. Nurserymen.	0.34	1.00
Annual and perennial flowers	Brooks	B. Casement	AHRC All America Selections	Active. Report to AAS and Seed Companies. AHRC Summary Report 86-2. AHRC Annual Report 1985.	0.21	0.65
Nursery production of woody ornamentals	Brooks	B. Casement	AHRC	Active. AHRC Annual Report 1985. Nurserymen.	0.30	0.70
Overwintering trials of containerized nursery stock	Edmonton	H. Oosterhuis C. McIsaac	ATN & HC	Complete. Annual Research Summary.	0.10	0.15
Monitoring of transplanted container grown plants	Edmonton	H. Oosterhuis	ATN & HC	Ongoing.	0.05	0.10
Seed propagation testing native species INV 30	Edmonton	G. Grainger P. King	ATN & HC ENR	Ongoing.	0.10	0.20
Container vs Bareroot Evaluation INV 42	Edmonton Brooks	G. Grainger B. Casement H. Oosterhuis	ATN & HC AHRC ATN & HC	Active.	0.05	0.05
Screening poplar cultivars for resistance to winter injury and bud-gall mites	Brooks	K. Mallett B. Casement	AHRC AHRC	Active. AHRC Annual Report 1985.	0.01	0.02
Regional woody plant hardiness test program	Various Alberta Sites	LANTA Growers B. Casement H. Oosterhuis G. Grainger	LANTA AHRC ATN & HC ATN & HC	Active.	0.15	0.25

ORNAMENTALS, TREES AND SHELTERBELTS (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Antidesiccant Studies of Evergreens	Brooks	K. Mallett B. Casement	AHRC AHRC	Active.	0.01	0.02
Fairy Ring Eradication	Brooks	K. Mallett R. Howard	AHRC AHRC	Active.	0.01	0.02

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Bush and native fruit culture and cultivar improvement	Brooks Edmonton	S. Mahadeva G. Grainger	AHRC ATN & HC	Active. AHRC Annual Report 1985.	0.25	0.40
Native fruit pilot project	Sexsmith Manning Fairview	S. Mahadeva J. Davidson	AHRC Ag Canada Beaverlodge	Active.	0.18	
Small fruit culture and cultivar improvement	Brooks	S. Mahadeva	AHRC	Active. AHRC Annual Report 1985.	0.25	0.60
Processing and quality evaluation of fruits	Brooks	T. Smyrl S. Mahadeva	AHRC AHRC	Active.	0.02	0.04
Native fruit utilization	Brooks	T. Smyrl	AHRC	Active.	0.20	0.20

VEGETABLES AND POTATOES

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Bulb crops cultural and cultivar project	Brooks	P. Ragan	AHRC	AHRC Annual Report 1985. AHRC Pamphlet 86-4, 86-5.	0.20	0.30
Cole crop cultural and cultivar project	Brooks	P. Ragan	AHRC	AHRC Annual Report 1985. AHRC Pamphlet 86-4, 86-5.	0.20	0.25
Pea and bean cultural and cultivar project	Brooks	P. Ragan	AHRC	AHRC Annual Report 1985. AHRC Pamphlet 86-4, 86-5.	0.25	0.25
Sweet corn cultural and cultivar project	Brooks	P. Ragan	AHRC	AHRC Annual Report 1985. AHRC Pamphlet 86-4, 86-5.	0.05	0.05
Root crop cultural and cultivar project	Brooks	P. Ragan	AHRC	AHRC Annual Report 1985. AHRC Pamphlet 86-4, 86-5.	0.02	0.05
Solanaceous vegetable cultivar and cultivar project	Brooks	L. Hausher P. Ragan	AHRC AHRC	AHRC Annual Report 1985. AHRC Pamphlet 86-5, 86-6	0.01	0.20
Vegetable mulch and tunnel project	Brooks	L. Hausher	AHRC	AHRC Annual Report 1985. AHRC Pamphlet 86-5, 86-6	0.25	0.40
Vine crop cultivar and cultural project	Brooks	L. Hausher	AHRC	AHRC Annual Report 1985. AHRC Pamphlet 86-5, 86-6	0.15	0.40
Perennial vegetable cultivar and cultural project	Brooks	L. Hausher	AHRC	AHRC Annual Report 1985. AHRC Pamphlet 86-5.	0.01	0.10
Handling and storage of vegetables	Brooks	K. Mallett	AHRC	AHRC Annual Report 1985.	0.10	0.15
Processing and quality evaluation of vegetables	Brooks	T. Smyrl	AHRC	Active.	0.05	0.15
Chemical aspects of carrots in storage	Brooks	T. Smyrl K. Mallett	AHRC AHRC	Active.	0.05	0.15

VEGETABLES AND POTATO (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Potato cultivar improvement	Brooks Various locations	C. Schaupmeyer K. Mallett T. Smyrl D. Lynch	AHRC AHRC AHRC Ag Canada	Active. Several trials. AHRC Annual Report 1985, AHRC Pamphlet 86-7.	0.60	1.40
Potato production research	Brooks Various locations	C. Schaupmeyer	AHRC	Active. Several trials. AHRC Annual Report 1985.	0.40	1.00
Handling and storage of potatoes	Brooks	K. Mallett	AHRC	Inactive.		
Potato processing parameters	Brooks	T. Smyrl	AHRC	Active. AHRC Annual Report 1985.	0.07	0.15
Screening potato cultivars for resistance to Early Blight	Brooks	K. Mallett D. Lynch	AHRC Ag Canada	Active. AHRC Annual Report 1985.	0.05	0.05
Susceptibility of commonly grown potato cultivars to bacterial ring rot	ATN & HC Vancouver	S. DeBoer I. Evans J. Stenrue	Ag Canada Crop Protection	Completed. Reported to Alberta Potato Growers Annual Meeting	0.10	0.30
Eumartii wilt of potatoes	ATN & HC	S.F. Huang I.R. Evans J. Stenrue	Ag Canada Crop Protection	Completed. Paper. Canadian Plant Disease Survey 1985.	0.05	0.05
Evaluation of fungicides for the prevention of seed-piece decay in potatoes	Brooks	K. Mallett R. Howard	AHRC AHRC	Ongoing. AHRC Annual Report 1985.	0.01	0.01
Survey of wilt diseases in seed potato fields in Alberta	Various locations	K. Mallett	AHRC	Completed. AHRC Annual Report 1985.	0.01	0.01

FOOD PROCESSING

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Reducing sugar decomposition during dehydration	Brooks	T. Smyrl	AHRC	Complete. AHRC Annual Report 1985.	0.05	0.20
Monitoring processing by x-rays	Brooks	T. Smyrl	AHRC	Inactive.		
Sugar beet storage	Taber Brooks	P. Bergen T. Smyrl	Sugar Beet Co. AHRC	Completed. AHRC Annual Report 1985.	0.10	0.30
Utilization of cull carrots	Brooks	T. Smyrl S. Wientraub	AHRC FPDC, Leduc	Active.	0.03	0.10

GREENHOUSE CROPS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Culture of greenhouse vegetable crops	Brooks	G. Grant	AHRC	Ongoing and new trials. AHRC Annual Report 1985.	0.20	0.20
Culture of greenhouse floriculture and foliage crops	Brooks	G. Grant	AHRC	Ongoing and new trials. AHRC Annual Report 1985.	0.20	0.20
Evaluation of hydroponic systems for greenhouse crops	Brooks	G. Grant	AHRC	Active.	0.05	0.20
Diseases of greenhouse crops	Brooks	R. Howard G. Grant	AHRC AHRC	Active.	0.05	0.10
Evaluation of rockwool as a substrate for Alberta greenhouse flower and vegetable crops	Brooks	G. Grant	AHRC	Active.	0.20	0.30

SOIL MANAGEMENT - FERTILIZERS - ANALYSIS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Assessment of deep plowing, ripping and ammendment of applications as a method of improving solonetzic soils	45 locations	J. Lickacz	Soil Branch	Ongoing.	0.50	0.50
Fertilizer requirements of irrigated grains and oilseeds	2 major locations 3 on-farm locations	R.H. McKenzie	Soil Branch	Ongoing.	0.30	1.50
Fertilizer requirements of dryland crops	1 major location 2 on-farm locations	R.H. McKenzie	Soil Branch	Ongoing.	0.20	0.40
Fertilizer requirements of irrigated special crops	10 locations	R.H. McKenzie R. Gaudiel	Soils Branch AHRC	Ongoing.	0.20	1.00
Crop response to liming and ripping of luvisolic soils	8 locations	J. Lickacz D. Penney	Soils Branch Soils Branch	Ongoing.	0.05	0.05
Fertilizer response and soil test calibration for barley and canola	3 locations	D. Penney	Soils Branch	Active.	0.15	0.30
Response of barley to residual K	3 locations	D. Penney J.A. Robertson	Soils Branch U of A	Active.	0.10	0.15
Soil acidity and liming (lime x fertilizer x ripping)	4 locations	D. Penney J. Lickacz	Soils Branch Soils Branch	Active.	0.10	0.20
Comparison of soil testing labs	1 location	R.H. McKenzie	Soils Branch	Ongoing.	0.05	0.20
Intensive Management of Barley and wheat	2 locations	D. Penny	Soils Branch	1986-88	0.10	0.30
Evaluation of Elemental Sulphur	2 locations	D. Penny D. Laverty	Soils Branch Soils Branch	1986-88	.05	.10

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Weed control in pulses	Brooks Bow Island	R. Esau	AHRC	Active. AHRC Annual Report 1985. Expert Committee on Weeds.	0.25	0.25
Weed control in coniferous transplants	Edmonton	H. Oosterhuis	ATN & HC	Ongoing.	0.05	0.10
Chemical weed control for nursery crops and shelterbelts	Brooks	R. Esau	AHRC	Active. AHRC Annual Report 1985. Expert Committee on Weeds. Canadian Hort. Council.	0.20	0.15
Chemical weed control in small and native fruit	Brooks	R. Esau	AHRC	Active. AHRC Annual Report 1985.	0.02	0.02
Weed control in vegetable crops	Brooks	R. Esau	AHRC	Active. AHRC Annual Report 1985. Expert Committee on Weeds. Canadian Hort. Council.	0.25	0.28
Weed control in potatoes	Brooks	R. Esau	AHRC	Active AHRC Annual Report 1985. Expert Committee on Weeds.	0.17	0.16
Herbicide residues in crop rotation	Brooks	R. Esau	AHRC	AHRC Annual Report 1985. Expert Committee on Weeds.	0.08	0.07
Application of herbicides through irrigation systems	Brooks	R. Esau	AHRC	Re-activated 1985. Expert Committee on Weeds.	0.03	0.07
Weed control trial and demonstration opportunities	Province-wide	D. Maurice D. Cole	Crop Protection Crop Protection	Ongoing.	0.40	0.50
The effect of herbicides on several forage species	Barrhead	D. Maurice J. Moyer L. Darwent	Crop Protection Crop Protection Ag Canada	Ongoing.	0.10	0.20

WEED CONTROL (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Herbicide screening trial for knotweed control	Oyen Delia Castor	D. Maurice D. Cole	Crop Protection Crop Protection	Ongoing. Annual Reports to Expert Committee on Weeds.	0.10	0.25
Equipment evaluation	Province-wide	D. Maurice T. Footz E. Wiens	Crop Protection Crop Protection PAMI	Completed 1985.	0.10	0.15
Herbicide screening trial and cultural control of tall buttercup in pasture	Foothils	D. Maurice D. Cole	Crop Protection Crop Protection	Initiated 1983. Continued.	0.10	0.25
Development of reclamation techniques for soil treated with residual herbicides	Tofield Namao	D. Maurice	Crop Protection IVMAA	Initiated 1983. Continued.	0.10	0.25
The effect of weed pressure on forage yield quality and stand persistence	Westlock	D. Maurice D. Cole J. Moyer L. Darwent	Crop Protection Crop Protection Crop Protection Ag Canada	Ongoing.	0.10	0.20
Control of scentless chamomile in cereals	Namao	D. Maurice	Crop Protection	Ongoing.	0.10	0.10
Control of tansy on roadsides	Smoky Lake	D. Maurice	Crop Protection	Ongoing.	0.05	0.10
Suppression of toadflax in cereal crops	Three Hills	D. Maurice	Crop Protection	Ongoing.	0.05	0.10
Efficacy of various chemicals in control and the potential for run off and for contamination of water when application is made to the edge of water in drainage ditches or rivers	County of Athabasca	W.A. Stearman R. Burland	Crop Protection AEC	Initiated 1986.	0.20	0.20

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Alfalfa leafcutter management	Brooks	U. Soehngen	AHRC	Completed.	0.05	0.05
Control of insects in greenhouse crops	Redcliff Medicine Hat	U. Soehngen	AHRC	Active. AHRC Annual Report 1985.	0.15	0.15
Control of corn insects	Redcliff Medicine Hat	U. Soehngen	AHRC	Active. AHRC Annual Report 1985.	0.40	0.40
Control of cabbage insects	Brooks	U. Soehngen	AHRC	Active. AHRC Annual Report 1985.	0.10	0.20

PUBLICATIONS

A. CROP PROTECTION BRANCH

- Controlling Brush in Alberta
- Rat Control on the Prairies
- Weed Alert Posters
- Guide to Crop Protection in Alberta - Part I - Chemical
- Guide to Crop Protection in Alberta - Part III - Pesticide Application Equipment
- Recognizing Herbicide Action and Injury
- Completed the Weeds of Alberta series.
- Backyard Pest Management
- Application and Incorporation of Granular Herbicides
- Electric Fences for Livestock Predation Control
- Emergency Procedures for Pesticide Issues
- Managing Herbicide Residues
- Field Scouting Manual
- Field Crop Insects of Alberta
- Weed Seedling Identification Guide
- Minimizing Erosion Under Summerfallow
- Roadside Vegetation Control - Operations Manual
- Vegetation Control Options For Rural Electrification Associations

DAVIDSON, J.G.N. and D.W. Sippell. 1984. Brown girdling root rot of rapeseed: defining the problem. In: Proceedings of the 5th Annual Meeting of the Plant Pathology Society of Alberta. Edmonton, Canada. November 1-2.

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C. FIELD CROPS BRANCH

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D. ALBERTA TREE NURSERY AND HORTICULTURE CENTRE

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E. ALBERTA HORTICULTURAL RESEARCH CENTER

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Gardener	Ms. Nancy Moroz
Ag. Officer (Warehouse)	Ms. Lydia Erickson
Gardener (Chemicals & Seeding)	Mr. Douglas Lehman
Gardener	Mr. Kevin Thorpe
Gardener (Farm Services)	Mr. Albert Faulkner
Gardener (Farm Maintenance)	Mr. Dave Wearmouth
Gardener	Mr. Cyril Cooreman
Gardener	Mr. Kevin Thorpe
Gardener	Mr. Bruce Chedzoy
M.S.W. (Machine Maintenance)	Mr. Paul Gervais
M.S.W.	Mr. Gerry Dames
M.S.W.	Mr. Brian Petherbridge
M.S.W. (Irrigation)	Mr. David S. Milne

ALBERTA HORTICULTURAL RESEARCH CENTER

Director	Mr. Thomas R. Krahn
Secretary/Personnel	Ms. Priscilla Petersen
Administrative Officer	Mr. Huber Ellis
Receptionist/Timekeeper	Ms. Betty Ann Humphreys
Accounts	Ms. Anna Moeller
Hostess/Librarian	Ms. Joyce Clark
Head, Environmental Horticulture Section and Fruit Specialist	Dr. S. Mahadeva (Retired August 31, 1985)
Fruit Crops Technologist	Mr. Te-Sen (Peter) Pih
Ornamental Specialist	Mr. Brendan Casement
Ornamentals Technologist	Mr. Nigel Seymour
Grounds Technologist	Mr. Rick Rumney (To February 28, 1986) Mr. Greg Feth (From March 1, 1986)
Greenhouse Crops Specialist	Mr. Gordon Grant (From May 6, 1985)
Greenhouse Crops Technologist	Ms. Cynthia Hill (To November 30, 1985) Mr. Rick Rumney (From March 1, 1986)
Section Secretary	Ms. Mayumi Tanigami-Bunney (To May 31, 1985) Ms. Pat Moskaluk (From July 15, 1985)
Head, Laboratory Services Section and Plant Pathologist	Dr. Ronald Howard
Plant Pathology Technologist	Mr. Ed Moskaluk
Post Harvest Specialist	Dr. Ken Mallett (From May 1, 1985)
Post Harvest Technologist	Mr. George Smith
Entomologist	Dr. Ulf Soehngen
Entomology Technologist	Mr. Art Tellier
Weed Control Specialist	Mr. Rudy Esau
Weed Control Technologist	Ms. Vickey Rumney
Food Processing and Quality Evaluation Specialist	Dr. Terry Smyrl
Food Processing Technician	Ms. Margaret Dench
Food Quality Technician	Mr. Joseph Hung
Diagnostician	Ms. Marilyn Dykstra
Section Secretary	Ms. Karen Chapman

Potato Specialist	Mr. Clive Schaupmeyer
Potato Technologist	Mr. Devon Curry
Potato Technologist	Mr. Greg Feth (To February 28, 1986)
Vegetable Crops Specialist	Dr. Paul Ragan
Vegetable Crops Technologist	Mr. Mike Haws (To May 2, 1986) Mr. Tug Maruno (From July 1, 1986)
Market Garden Specialist	Mr. Lloyd Hausher
Market Garden Technologist	Mr. Murray Briant
Seed Potato Specialist (Olds)	Mr. Jim Letal
Seed Potato Technologist (Olds)	Mr. Will Davis
Special Crops Specialist	Dr. Refe Gaudiel
Special Crops Technologist	Mr. Collin Wildschut
Unit Secretary	Ms. Kathy Irwin (To April 12, 1985) Ms. Mayumi Tanigami-Bunney (From June 1, 1985)
Farm Manager	Mr. Evert Borkent
Assistant Farm Manager	Mr. Henry Christesen
Heavy Duty Mechanic	Mr. Berend Witteveen
Maintenance Service Worker	Mr. Barry Merkl
Farm Worker	Mr. William Wise
Farm Worker	Mr. David Houseman
Farm Worker	Mr. Rudy Velting
Stockkeeper/Safety Officer	Mr. Bill Coffey

SOILS BRANCH

Head	Mr. Adolph Goettel
Branch Secretary	Ms. Joan Seath
Supervisor, Soil Fertility	Mr. Douglas Penney
Supervisor, Soil Management	Mr. Jerome Lickacz
Technologist	Mr. Lloyd Davison
Technologist	Ms. Ellen Kastelic
Soil Specialist - Lethbridge	Mr. Ross McKenzie
Technologist - Lethbridge	Mr. Charles Anstey

Agricultural Soil & Feed Testing Laboratory

Director	Mr. Donald Laverty
Office Manager	Ms. Chitra Marikar
Secretary	Ms. Marilyn Touchette
Head, Soils Section	Mr. James Carson
Head, Plant and Animal Feed Section	Dr. Edward Redshaw
Laboratory Supervisor, Plant and Feeds	Dr. Hua Hsu
Laboratory Supervisor, Soils	Dr. Arthur Bollo-Kamara
Soils Specialist	Mr. Len Kryzanowski
Laboratory Technician	Mr. Roy Panasiuk
Laboratory Technician	Mr. Siegfried Harke
Laboratory Technician	Mr. Chung Lam
Laboratory Technician	Mr. Ervin Prommer
Laboratory Technician	Ms. Marie Siegenthaler
Laboratory Technician	Ms. Shelley Eliuk
Laboratory Technician	Ms. Penelope Chong
Laboratory Technician	Mr. Chii-Guary Tsai
Laboratory Technician	Mr. Dale Barlund
Key Punch Operator	Ms. Shirley Beaudry
Key Punch Operator	Ms. Denise Trottier

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Potato Technologist	Mr. Greg Feth (To February 28, 1986)
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Laboratory Technician	Ms. Penelope Chong
Laboratory Technician	Mr. Chii-Guary Tsai
Laboratory Technician	Mr. Dale Barlund
Key Punch Operator	Ms. Shirley Beaudry
Key Punch Operator	Ms. Denise Trottier

REGIONAL CROPS PRODUCTION SPECIALISTS

Region 1 - Lethbridge	Mr. Blair R. Shaw
Region 2 - Airdrie	Mr. Larry J. Welsh
Region 3 - Red Deer	Mr. Wayne Jackson
Region 4 - Vermilion	Mr. Ellis L. Treffrey
Region 5 - Barrhead	Mr. William Chapman
Region 6 - Fairview	Mr. Mike Rudakewich

REGIONAL SPECIALISTS

Region 1 - Lethbridge	Mr. Blair Roth
Region 2 - Airdrie	
Region 3 - Red Deer	
Region 4 - Vermilion	Mr. Bjorne Berg
Region 5 - Barrhead	Mr. Ken Lopentinsky
Region 6 - Fairview	Mr. Garry Coy